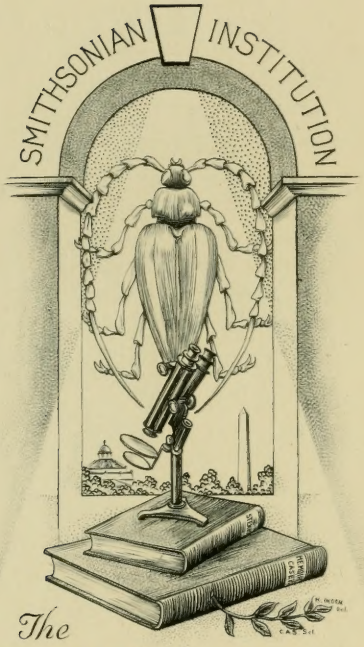

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ERRATA.

Page 9, line 7, "tarsis" omitted before "5-articulatis."

[Pages 30, 34, and 35. The notes and descriptions of *Sycoscapter* are applicable only to the male sex, incomplete specimens of which were mistaken for females; hence the observation relative to Dr. P. Mayer's *Ichneumon ficarius*, female, is incorrect, as stated in my subsequent paper, p. 376. To avoid further confusion it will be advisable to separate the species with *Idarnella*-like females (*C. caricæ*, *ficarius*, *4-setosa*, and *aterrima*), but with subapterous males, under a different generic name, for which that of *Idarnodes* may be used.—J. O. W.]

Page 11, last line, and p. 20, l. 3 and l. 9, for "*Prionastomata*" read "*Prionostomata*," and for "*Aploastomata*" read "*Haplostomata*."

Page 330, line 13, for "2nd" read "1st."

Page 376, line 20, for "joints" read "points."

Page xvii, line 24, for "forms" read "forces."

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1876 † Rye, Edward Caldwell, F.Z.S., *Somerset Villa, Upper Richmond-road, Putney*, S.W.
1865 Rylands, Thomas Glazebrook, F.L.S., F.G.S., *Highfields, Thelwall, Warrington.*

1875 Sallé, Auguste, 13 *Rue Guy de la Brosse, Paris.*
1866 † Salvin, Osbert, M.A., F.R.S., F.L.S., &c., 10 *Chandos-street, Cavendish-sq.*, W.; and *Hawksfold, Fernhurst, Haslemere.*
1865 † Saunders, Edward, F.L.S., Treasurer, *St. Ann's, Mason's Hill, Bromley, Kent.*
1861 † Saunders, G. S., *St. Stephens, Canterbury, Kent.*
* Saunders, Sir Sidney Smith, C.M.G., *Gatestone, Central Hill, Upper Norwood*, S.E.
1865 Schaufuss, L. W., Ph.D., M.Imp.L.C.Acad., &c., *Dresden.*
1881 Scollick, A. J., *Albion Lodge, Putney*, S.W.
1880 Scott, Sir Arthur, Bart., F.L.S., 97 *Eaton-square*, S.W.; and *Great Barr Hall, Birmingham.*
1875 † Sealy, Alfred Forbes, *Cochin, South India.*
1864 Semper, George, *Altona.*
1862 Sharp, David, M.B., *Eccles, Thornhill, Dumfriesshire.*

1883 Shaw, A. Eland, 13 *Lanhill-road, Paddington*, W.
1883 † Shelley, Capt. George E., 13 *Rutland Gate*, W.
1847 Shepherd, Edwin.
1867 Sidebotham, Joseph, F.L.S., F.R.A.S., F.S.A., *Erlesdene, Bowdon, Cheshire.*
1877 Slater, John Wm., 36 *Wray-crescent, Tollington Park*, N.
1883 Smith, Frederick W., *Hollywood House, Dartmouth Point, Blackheath, Kent.*
1869 Smith, Henley Grose, 20 *Finsbury Circus*, E.C.
* † Spence, William Blundell, *Florence.*
1848 † Stainton, Henry Tibbats, F.R.S., F.L.S., F.G.S., &c., *Mountsfield, Lewisham*, S.E.
1862 Stevens, John S., 38 *King-street, Covent Garden*, W.C.
1837 Stevens, Samuel, F.L.S., *Loanda, Beulah Hill, Upper Norwood*, S.E.
1882 Swanzy, Francis, *Stanley House, Granville-road, Sevenoaks.*
1876 Swinton, A. H., *Binfield House, Waterden-road, Guildford.*

1856 Thomson, Jas., 12 *Rue de Presbourg, Place de l'Etoile, Paris.*
1882 Todd, Richard, 5 *Princes-terrace, Bayswater*, W.
1859 † Trimen, Roland, F.R.S., F.L.S. (Curator of South African Museum), *Cape Town, Cape of Good Hope.*

1869 Vaughan, Howard, 11 *Ospringe-road, Brecknock-road*, N.W.
1866 Verrall, G. H., *Sussex Lodge, Newmarket.*

1876 Wakefield, Charles Marcus, F.L.S., *Belmont, Uxbridge.*
1870 Walker, Rev. Francis Augustus, D.D., F.L.S., 33 *Bassett-road, Notting Hill*, W.
1878 S. Walker, J. J., R.N., 12 *Ranelagh-rd., Marine Town, Sheerness.*
1863 † Wallace, Alfred Russel, F.L.S., F.Z.S., &c., *Nutwood Cottage, Frith Hill, Godalming.*
1866 † Walsingham, Thomas de Grey, Lord, M.A., F.L.S., F.Z.S., &c., *Eaton House, Eaton-square*, S.W.
1866 Ward, Christopher, F.L.S., *Savile-road, Halifax.*
1869 Waterhouse, Charles O., *British Museum, Cromwell-road*, S.W.
* Waterhouse, George R., F.Z.S., &c., *Curton Lodge, Disraeli-road, Putney*, S.W.
1869 Websdale, C. G., 78 *High-street, Barnstaple.*
1845 Weir, John Jenner, F.L.S., *Chirbury, Beckenham, Kent.*
1876 Western, E. Young, 27 *Craven Hill Gardens, Bayswater*, W.
* Westwood, John Obadiah, M.A., F.L.S., &c., Honorary Life President, 67 *Woodstock-road, Oxford.*
1882 Weymer, Gustav, 58 *Kleeblattstrasse, Elberfeld, Rhenish Prussia.*
1868 † White, F. Buchanan, M.D., F.L.S., *Annat Lodge, Perth*, N.B.
1865 White, Rev. W. Farren, *Stonehouse Vicarage, Gloucestershire,*
1882 Williams, W. J., *Zoological Society, Hanover-square*, W.
1874 Wilson, Owen, *Cwmffrwd, Carmarthen.*
1881 Wood, Theodore, 5 *Selwyn-terrace, Jasper-road, Upper Norwood*, S.E.
1874 Wood-Mason, James, F.G.S., F.L.S. (Curator of the Indian Museum), *Calcutta.*
1862 Wormald, Percy C., 10 *Cromwell-avenue, Highgate*, N.

1865 S. Young, Morris, *Free Museum, Paisley.*

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THE

TRANSACTIONS

OF THE

ENTOMOLOGICAL SOCIETY

OF

LONDON

FOR THE YEAR 1883.

I. *Descriptions of three new genera and species of fig insects allied to* Blastophaga *from Calcutta, Australia, and Madagascar; with notes on their parasites and on the affinities of the respective races.* By Sir Sidney S. Saunders, C.M.G.

[Read September 6th, 1882.]

Plates I.—III.

Some time back Mr. Wood-Mason, on his return to India from this country, forwarded to me a small bottle containing about a dozen diminutive figs of *Ficus Indica*, which he had gathered in the Botanical Gardens at Calcutta on the 15th of May, accompanied by a glass tube wherein he had also plunged numerous minute insects which he had found in some of the same figs. Many of these figs, as he observed, had a large hole at the apex, made, as he conceived, by an obese grub, whereof specimens were also sent, one of these being found "in almost every receptacle." Such apertures, however, are usually effected by the inmates as the ordinary means of egress; and the presence of these

apod grubs, which could not have operated from without, would seem to be rather attributable to some later intruder having penetrated by such orifice into the fig to deposit her ova. In many instances the winged species of the fig-insects "issued from the mouth of the receptacle in a cloud the moment they felt the pressure exerted in pulling off the fig," which explains the absence of some of the sexes; although others, in a less advanced stage of development, were arrested when in the act of emerging from the seed-vessels wherein they had been nurtured. A large number of apterous individuals of different species, among which some approximating to those fancifully designated by Walker as "a working class" or "neuters ?," pervaded the interior of these figs, many of these being more or less mutilated, and, as Mr. Wood-Mason remarks, "even the tips of the mandibles are often found bitten off." A similar result has been noticed in the males of *Sycophaga*, which never quit the fig, but are found dead within before the females are ready to emerge from the seed-vessels, impregnation having apparently been effected, as in *Blastophaga*, while they are still retained within the pericarp, after which period the females would seem to be unapproachable by these blind rovers. One of these male *Blastophagæ*, penetrating a seed-vessel containing the female, has been recently figured by Prof. Westwood in our 'Transactions' (1882, pl. iv., fig. 31); and in the 'Proceedings' of the Holmesdale Natural History Club of Reigate and Red Hill for 1880 (p. 48), presented to our Library, I have recorded some further observations thereon; but in the Australian species, hereinafter adverted to, fecundation is not limited to this early period (*vide diagnosin*).

The germ-feeders found in the *Ficus Indica* essentially differ from those of the European fauna, the serrate mandibular appendages of the female being of a more complex and elaborate character; the 11-serrate spatulate process attached to the base of the mandibles having also a rigid exarticulate lobe laterally appended thereto and free beyond its basal attachment, extending to about three-fourths of the length of the former, furnished with seven stout elongate teeth, as shown in Plate I., figs. 10 to 13. The antennæ in this sex are also very remarkable, the five terminal joints being distinctly separated from each other, the 8th to the 11th cyathiform, surrounded by a compact mass of recumbent setæ forming

a coronated apex; the 8th joint is considerably larger than the rest, which are nearly co-equal with each other, and the conical 12th is nearly concealed within its overlapping garniture. These large ornate joints, together with the small 5th, 6th, and 7th (the 5th being very minute) are cærulescent, the four basal joints contrasting therewith as pale yellow; of these the scape is elongate-oval, the 2nd joint longer than broad and internally curvate, the 3rd short and transverse, and the 4th projecting externally and constituting an acute elongate spine, the minute 5th joint being inserted at its inner base. (Plate I., fig. 14).

The veining of the fore wing is also very peculiar, the ordinary deflexed cubitus being entirely absent on the disc, the post-costal vein diverging from the costa and terminating towards the middle of the anterior margin, but apart therefrom, in an elongate clava having a beak-shaped apex, with a hair-like prolongation traceable far in advance. The posterior margin of the wing is obliquely deflected in a straight line from the base to about the middle, beyond which it is delicately fimbriated to the apex. The disc is smooth, with a series of fine striæ beyond its centre. The hind wing is subacuminate at the apex, emarginate behind at its base, with the costa and post-costal vein forming together a strong arcuate belt extending to about half the length of the basal curve, and having an oblique prolongation, less defined, up to the marginal centre where uniting with the fore wing by three hooklets.

The head of the female is elongate-oval, with the usual longitudinal furrow above, and having a prominent recurvate horn at the base. (Plate I., fig. 5). The thorax is of the same width as the head and rather longer; the fore legs are small, with the femora slightly distended, short curvate tibiæ, and long tarsi; the middle legs are long and slender, and the hind legs have short femora, broad at the base and narrow at the apex; the tibiæ are very short, narrow at the base, and broadly truncate at the apex; the tarsi very elongate; all being five-jointed. The abdomen is about the same length and width as the head; the ovipositor slender and flexible, about twice the length of the abdomen, and its sheaths, when apart therefrom, are usually spirally curled.

The apterous male has a small head, rather broader than long, with black subrotundate maculæ in the position

of the eyes, small trigonate bidentate mandibles, and short fleshy four-jointed antennæ, porrected in front; the 1st joint small and trigonate, recurved at the base; the 2nd larger and subovate; the 3rd shorter, its basal moiety contracted and curved; and the terminal joint oblong, tumid and setose at the apex. It may be readily distinguished from all others by its elongate, straight, anterior femora, as long as the prothorax, and closely pressed against its sides, with very diminutive broad crenated tibiæ, compressed five-jointed tarsi, and stout claws. The pronotum is very large and scutiform, the mesonotum short and transverse, and the metanotum narrower and rounded behind. The middle pair of legs (which are very long and slender in *Blastophaga*) are rather shorter than the others, with the femora subglobose, the hind tibiæ short and straight, and their tarsi, like those of the posterior pair, having five well-developed joints nearly equal in length, with moderate claws and long pulvilli. The coxæ and femora of the hind legs are very robust; the tarsi shorter than the middle pair, subtrigonate, and very broad at the apex, obliquely truncate, and armed with several stout spines; the claws rather larger than those of the intermediate tarsi, and internally dilated.

I propose to designate this very remarkable genus and species by the name of *Eupristina masoni*, as distinguished from all others by the wing-veins, and by the duplex character of the serrate mandibular appendages in the female, as well as by the peculiar structure of the fore legs in the male. The practical application of the additional lobe attached to the base of the serrate spatulæ, furnished with a collateral series of long teeth, may seem scarcely intelligible, although the action of the former is sufficiently obvious while the females are seen working their way out of the pericarps, swaying their heads to and fro to effect their emancipation. When, however, the fig is laid open, the seed-vessels, deprived of their usual moisture, soon assume a pergameneous consistency, retaining the hapless inmates by the thoracical region unless fresh moisture be freely applied. This difficulty may not unfrequently occur in a warm temperature, when the lateral lobe may be available as an additional aid to prevent the sides of the aperture from prematurely closing, and enable the serrate process to operate more freely and efficaciously by such double action.

EUPRISTINA,* n. g.

Mas apterus. *Caput* transverso-ovale. *Oculi* maculis subrotundis nigris indicati. *Antennæ* breves, glabræ 4-articulatæ; articulo 1mo parvo, subtrigono; 2do triplo majore, basi latiore externe rotundato; 3tio brevi, dimidio basali constricto, curvato; 4to tumido, ovato, apice setis brevibus instructo. *Mandibulæ* subtrigonæ, parvæ, bidentatæ. *Palpi* obsoleti. *Thorax* gibbus, capite dimidio latior; pronoto magno, scudiformi; mesonoto brevi, transverso, lateribus rotundatis; metanoto semicircolari. *Pedes antici* femoribus valde elongatis, rectis, lateribus parallelis, apice truncatis, basi constrictis, ad pronotum proximis longe porrectis; coxis oblongis, latis, disco compressis, concavis, apice oblique auriculatis, acutis; tibiis latis, brevissimis, latere crenatis, apice bilobatis; tarsis parvis, robustis, 5-articulatis, articulis brevissimis, arctissime conjunctis, unguibus majusculis; *intermedii* femoribus parvis, inflatis; tibiis brevibus, curvatis, apice dilatatis, spinosis; tarsis elongatulis, 5-articulatis, articulis æqualibus, tenuibus, unguibus parvis; *postici* majores, femoribus longioribus, crassioribus; tibiis subtrigonis, apice externe uncinnatis; tarsis mediocribus, 5-articulatis, articulis æqualibus, unguibus magnis. *Abdomen* elongatum, segmentis basalibus quatuor ventricosis, reliquis tribus sæpe subtus deflexis vel intus retractis, tubum elongatum efficientibus; genitalium apice haud rarius ultra caput subtus porrecto.

Fœmina alata. *Caput* vix longius quam latum, postice paullo latius, disco in longum fossulatum, lateribus prominulis, antice transverse canaliculatis. *Oculi* magni, ovales. *Ocelli* inconspicui. *Mandibulæ* satis magnæ, basi latæ, apice bidentatæ; spatula basali elongata, exarticulata, subter capite retro producta, striata, striis in dentibus fere 11 acutis latere interno productis; cujus ad basin lobo angusto, elongato, rigido, exarticulato, proximo sed diviso, latere interno affixo, hoc dentibus 7 instructo; his et illis duplici serie simul oblique distinguendis. Clypeus marginis medio in angulum deflexum productus. *Mentum* profunde situm, basin versus processu frondiformi utrinque usque ad apicem producto. *Labium* elongatulum, tenue, palpis gracillimis. *Maxillæ* biarticulatæ, articulis elongatis,

* πριστὴς, qui serrâ secat.

basali tumido, apicali tenui. *Antennæ* capite fere duplo longiores, 12-articulatæ; scapo magno subovali, articulo 2do oblongo, sinuoso; 3tio brevi, transverso; 4to in spinam acutam externe producto; 5to minimo; 6to et 7mo angustis, parvis; 8vo maximo, cyathiformi, setis densis recumbentibus antice productis vestito; 9no—11mo præcedenti similibus sed minoribus, coæqualibus; extimo setis obtecto, conico. *Thorax* capitis latitudine, dimidio longior; pronoto scudiformi, angulis anticis rotundatis; mesonoto subquadrato, metanoto angustiore, postice rotundato. *Alæ anticæ* latæ, postice basi usque marginis mediam oblique truncatæ, deinde usque apicem ciliatæ, disco glabro; costa abbreviata, vena postcostali inspissata, a margine late divergente, parum arcuata, longitudinis alæ ante mediam in clavam elongatam acuminatam recte producta, antice margini propinque tenuissime prolongata; *vena deflexa cubitalis* deest: *alæ posticæ* subacuminatæ, postice basi emarginatæ, margine fimbriatæ; costa cum vena postcostali coalitis arcuatis, basi validis; hæc marginis medio setis brevibus tribus deflexis apice instructa. *Pedes*, tarsis omnibus 5-articulatis, pulvillis valde productis; *antici* parvi, coxis subovalibus, femoribus superne arcuatis, subtus rectis; tibiis brevibus, curvatis, apice dilatatis, spinosis; tarsis longioribus, articulis subæqualibus, unguibus majusculis, tenuibus; *intermedii* longi, tenui, coxis transverse dilatatis; femoribus brevibus, parum inflatis, basi constrictis; tibiis elongatis, subrectis, basi tenuioribus, apice angulo interno in spinam tenuem producto; tarsis elongatulis, articulo basali paulo longiore, unguibus parvis, gracilibus; *postici* coxis magnis, femoribus brevibus, basi valde dilatatis; tibiis robustis, brevioribus, basi tenuibus, apice recte truncatis, angulo interno uncinnatis; tarsis valde elongatis, articulo basali curvato, longiore, reliquis subæqualibus, unguibus majusculis, interne dilatatis. *Abdomen* ovale, thorace brevius; oviductu gracillimo, flexili, abdomine duplo longiore, vaginis tenuissimis sæpe in spiram flexis.

Eupristina masoni, n. s.

Mas testaceus, antennis pallide flavis, pronoti disco vitta ovali circumsignato, abdomine albido. *Fœmina* capite (basi excepto) pedibusque pallide flavis; antennis articulis 4or basalibus (nonnullis 5toque) flavis, reliquis

cærulescentibus ; capitis basi thoraceque viridibus ; alis hyalinis, glabris, costa basi picea, vena postcostali lutea ; abdomine nitido, piceo, basi plus minusve testaceo. Long. corp.—mas, $1\frac{1}{2}$ mm. ; fœmina, $1\frac{3}{4}$ mm. Exp. alar. $2\frac{1}{2}$ mm.

Hab. In grossis *Ficus Indicæ* e germinibus Maiæ Idus exeuntes horto botanico Calcuttæ. Dom. J. Wood-Mason cum ficubus ipsis amicissime communicavit.

In Mus. Hopeiano Oxoniæ, et nostro.

Note.—The measurements in the males of this and the two following species are exclusive of the retractile abdominal segments after the 4th. The relative length of the ovipositor in the females is computed from the apex of the abdomen, exclusive of its subjacent and more or less internally concealed basal portion.

I have also recently received from New South Wales both sexes of another remarkable species allied to *Blastophaga*, the ovipositor, however, being as long as the abdomen, and the mandibles of the female, together with their serrate appendages, being furnished with about thirty sharp teeth, forming one continuous saw from end to end, thus constituting a most effective implement, whose structure may favourably compare with any in use at the present day ; the falcate mandible representing the ordinary curvate handle, and the four following teeth appertaining to the broad base of the saw, the residue (twenty-six) being on the inner margin of the transverse striæ of the appendage. (Plate II., fig. 25).

The antennæ of the female are also peculiar. The scape is distended and suboval ; the 2nd joint short and as broad as long, the 3rd joint forming the usual spinose projection, though short and subtrigonate ; the 4th is longer than broad, but small ; the two following joints are compressed and longitudinally striated, equal in size, with the sides parallel, and truncate at the base and apex ; the 7th and 8th are shorter and somewhat cyathiform ; the last three (9th to 11th) forming an elongate fusiform clava.

The head is very large, much compressed, twice as long as broad, the sides parallel and rounded at the base, with a very short terminal horn. The thorax is about the same length as the head ; the prothorax narrow in front and subtrigonate, the apex being attached below

the base of the former, which is frequently deflected at right angles therewith; the mesothorax and metathorax are gibbous and as wide as the head. The fore wings have the cubital vein projected almost at a right angle on the disc, having a wedge-shaped clava pointing towards the outer margin, the disc being clothed with short recumbent setæ, and the margin fimbriated around. The hind wings have the costa and post-costal vein robust at the base and strongly arcuate, with a slight prolongation to a central marginal tubercle bearing two or three hooklets, the margin being fimbriated all round. The anterior and posterior legs are shorter than the intermediate pair, which are slender and elongate; the femora and tibiæ of the former are curvate, and those of the latter more robust, all the tarsi being elongate. The ovipositor is slender and curvate, slightly exceeding the length of the abdomen.

The apterous male has a small rotundate fuscous head, contrasting with the thorax, abdomen, and legs, which are fleshy white. It has seven-jointed antennæ projecting in front, and turned laterally after the 3rd joint. The basal joint is small and oblong, the 2nd large and subovate, the 3rd as long as the three following, which are small and compact, and the terminal joint is tumid and subglobose. (Plate II., fig. 20).

The foregoing characters will readily serve to discriminate this new genus and species, for which I propose the name of *Pleistodontes imperialis*, in allusion to the multiserrate mandibular appendages of the female.

Pleistodontes, n. g.

Mas apterus. *Corpus* angustum, elongatum, molle. *Caput* parvum, subsphæricum, antice truncatum. *Oculi* parvi, rotundi. *Clypeus* pone antennas in longum canaliculatus, spina intermedia elongata, acuta, basi antice porrecta. (Tab. II., fig. 21). *Mandibulæ* parvæ, subfalcatæ, apice bidentatæ; processibus duobus brevibus, apice transverse dilatatis, conjunctis, inter mandibulas porrectis. (Tab. II., fig. 22). *Antennæ* elongatæ, glabræ, 7-articulatæ; articulo 1mo parvo, oblongo, apice latiore; 2do magno, basi rotundato, apice truncato, longitudine latitudinem dimidio excedente; 3tio elongato, curvato, tribus sequentibus semel longiore; his brevibus, transversis, arcte conjunctis; extimo (7mo)

tumido, magno, apice setis brevibus instructo. *Thorax* capite dimidio longior, antice capitis latitudine; pronoto elongato, postice vix latiore, truncato, lateribus rectis; mesonoto brevi, transverso; metanoto longiore, postice rotundato. *Pedes antici* robusti, coxis subquadratis, angulis rotundatis; femoribus basi valde dilatatis, apice sensim angustioribus; tibiis brevibus, curvatis, 5-articulatis, articulis compressis; unguibus validis. *Pedes intermedii* graciliores, coxis parvis, transversis; femoribus oblongis; tibiis elongatis, basi angustis, apice sensim sed parum dilatatis, inermibus; tarsis elongatis, 5-articulatis, articulis cæqualibus; unguibus elongatis, parum incurvis; *pedes postici*, coxis magnis, subrotundis; femoribus ovatis; tibiis brevibus, basi constrictis, apice latis, truncatis, angulo interno biuncinnatis; tarsis robustioribus, 5-articulatis; unguibus validis, pulvillis dilatatis. *Abdomen* elongatum, segmentis basalibus paullo inflatis, reliquis sensim angustioribus, infra recurvis.

Fœmina alata. *Caput* maximum, elongatum, compressum, lateribus subparallelis, postice rotundatum, angulis anticis prominulis, disco in longum canaliculato. *Oculi* ovales, prominuli, basi propinque siti. *Mandibulæ* majusculæ, basi subquadratæ, transverse striatæ, apice falcatæ, acutæ, latere interno basi 4-serratæ, appendice basali longissima, multiserrata, transverse striata, dentibus fere 26 margine interno instructa. *Ocelli* invisi. *Antennæ* 11-articulatæ, clavatæ, capite paullo longiores, prope marginem anticum fossulæ insertæ; scapo elongato, subovali, basi apiceque attenuato; articulo 2do brevi, lateribus rotundatis, 3tio in spinam subtrigonam externe producto; 4to parvo, elongato; reliquis majoribus, in longum rugose striatis; 5to et 6to compressis, lateribus subparallelis, basi apiceque truncatis; 7mo et 8vo brevioribus, sensim latioribus; ultimis tribus (scilicet 9no—11mo) clavam fusiformem constituentibus. *Thorax* elongatus, capitis latitudine, lateribus subrectis; pronoto parvo, antice truncato, angulis postice productis; mesonoto brevi, transverso; metanoto longiori, postice rotundato. *Alæ anticæ* latæ, vena postcostali basi cum costa coalita, postea in disco arcuata, apice ad marginem conjuncta; vena cubitali in rectangulum breviter deflexa, apice clava subtrigona acuta latere externo producta: *posticæ* angustæ, elongatæ, basi constrictæ, vena postcostali, cum costa breviter coalita,

valida, arcuata, apice, marginis mediam versus, setis duabus tribusve brevibus, in angulum deflexis, instructa; alarum ambarum disco setis brevibus sparsim induto, marginibus gracillime fimbriatis. *Pedes* tarsis omnibus 5-articulatis; *antici*, coxis parvis, subquadratis; femoribus brevibus inflatis; tibiis elongatis, robustis, basi apiceque constrictis, inermibus; tarsis unguibusque parvis; *pedes intermedii* longi, coxis parvis, transversis; femoribus parum inflatis; tibiis, tarsisque, elongatis, gracillimis, unguibus subrectis; *pedes postici* breves, coxis subquadratis; femoribus robustis apice constrictis; tibiis brevissimis, subtrigonis, apice latis, truncatis, spina acuta elongata angulo interno armatis; tarsis robustioribus, articulo basali longiore, curvato; unguibus parvis, pulvillis dilatatis. *Abdomen* elongatum, basi thoracis latitudine, apice sensim attenuatum; oviductu gracili, curvato, abdominis fere longitudine.

Pleistodontes imperialis, n. s.

Mas capite saturate fusco; antennis, thorace, pedibusque pallide stramineis; abdomine albido. *Fœmina* omnino nigra, alis cineriis. Long. corp.—mas, $1\frac{1}{4}$ mm.; fœmina, $1\frac{3}{4}$ mm. Exp. alar. 3 mm.

Hab. Australasiæ, *Ficus macrophyllæ* grossis, *Ficus Australis* quoque; ab his mense Junio, illisve mense Februario, emergentes. Mares cum fœminis copula conjunctos in ficus pulpa liberos bis inveni.

In Mus. Hopeiano Oxoniæ, et nostro.

The species of *Ficus* from which these germ-feeders were obtained is described as having a long dark shining leaf, like that of the laurel, commonly known locally as the Moreton Bay fig-tree, growing wild in the mountainous regions, but introduced as an ornamental tree in gardens at Sydney. The insects were ready to emerge early in February, when, on opening some of these figs, many of their inmates flew out. Numerous specimens of a black species of *Idarnes* (all females) with a tubiform prolongation of the abdomen, allied to *I. transiens*, Wlk., were also found therewith, together with other parasitic races.

Those appertaining to this category, which were obtained from the figs of *Ficus Indica*, will be described by Professor Westwood in treating of Walker's types of

like origin. Some of the apterous species are furnished with rudimentary alary appendages, consisting of a long filamentary multiarticulate process emanating from the mesonotum on either side, and coiling about among the legs. These, as well as a large-headed species having rudimentary wings of a different character, were in some few instances extracted from closed pericarps, distended, in the latter case, to larger dimensions, where they were doubtless parasitic on the original occupants of these abodes; the co-existence of a well-defined germ-feeding community having now been detected, which must have already quitted the figs of the same species of *Ficus* from which Walker's specimens were obtained. Hence it follows that whensoever the primary inmates of these seed-vessels have been duly determined by structural affinities, all divergent races found in those recesses must be regarded, *primâ facie*, unless otherwise authenticated, as hostile intruders which have only obtained such a habitaculum for their offspring when rendered available by the agency of their victims, in whose bodies oviposition has been effected while yet immature and incarcerated within. Casual visitants, which deposit their ova in the pulp after the phytophagous brood has effected its exit, are readily recognisable by their larval progeny, as in the case of the aforesaid obese grubs, the larvæ of *Oscinis*, and others.

It may here be observed that the heterogeneous association of predaceous and non-predaceous races among Walker's so-called *Agaonidæ* involves a palpable paradox, their severance being enjoined by due regard to their respective habits. Thus his fig species of *Idarnes*, no less than his supposed "neuters?" of *Sycobia*, and even his type of the latter,—a winged male, as Professor Westwood has lately determined,—now found concomitant with the germ-feeding brood of *Eupristina*, can have no tribal affinity with *Agaon*, whose natural alliance with *Blastophaga* was first pointed out by the latter, many years back, in our 'Transactions' (vol. ii., p. 223), the serrate mandibular appendages in both amply testifying to this effect. It would thus seem befitting to disintegrate this phytophagous group as a distinct subfamily of *fig-insects proper*, excluding therefrom all presumably parasitic types; the former being defined as *Sycophagides*, comprising two sectional divisions—the *Prionastomata* and the *Aploastomata*—founded upon their

respective mouth-parts; and the latter as *Sycocolacides*, unless appertaining to other sectional groups.

But this primary severance of the respective races would obviously seem to point to the incongruous position occupied of late by the *Sycophagides* among the entomophagous *Chalcididæ*, and, as a necessary corollary, to prescribe their transfer to a more congenial sphere, by restoring them, as heretofore, to the vegetable-feeding *Cynipidæ*, where their alliance is more naturally indicated. Exceptional instances have indeed been cited of the latter being abnormally addicted to parasitism; while, on the other hand, some of the *Eurytomides* are alleged to diverge from the well-known zoophagous propensities of their race, and to be not only plant-feeders, but also gall-producers, though many distinguished writers have hesitated to accept such an anomalous conclusion, which others have confidently expounded as the result of diligent investigation; but, be this as it may, the characteristic habits of these germ-devouring fig-insects—for whom all need of gall-protection is superseded by the nature of their domicile—assimilate them to cognate phytophagous communities, in accordance with the position previously assigned them, while militating against any confraternity with a hostile race having no kindred bonds of fellowship to constitute a family alliance therewith.

The economy of *Agaon*, whose structural characters had long proved so embarrassing, was utterly unknown when Latreille, at a venture, placed this genus next to *Eurytoma* in Cuvier's 'Animal Kingdom'; while its near allies, the *Blastophagæ*, are simultaneously adverted to, as a species employed in caprification, under the heading of *Cynips*, Linn.; and it would seem difficult to comprehend the rejection of their acquired title as such, when other far more aberrant instances present themselves of actual parasitism exceptionally witnessed among non-gallicolists (such as some species of *Figites*, *Allotria*, &c.) which are nevertheless tolerated in the same ranks with the *Cynipidæ* as co-heirs to their titular domain.

It appears, however, to have been assumed *à priori* as an axiom—when little was known upon the subject beyond the revelations of certain writers more or less antiquated—that *all* these fig-denizens were *fruit-feeders*; but subsequently, when other species were found commingled therewith—such as those brought from Madras

by Sir Walter Elliot and now in the British Museum—some difficulty was experienced as to discriminating between friend and foe; and thus, partly from this circumstance, partly also in consequence of certain fortuitous complications to which I shall presently advert, but mainly perhaps from the paucity of available materials, the subject has remained, as it were, in abeyance for a considerable period, during which the opportunities for prosecuting researches in a wider field were unaccountably neglected, as recently testified by Dr. Paul Meyer's elaborate Treatise on Fig-insects ('Zur Naturgeschichte der Feigeninsecten,' Mitth. d. Zool. Station z. Neapel, Bd. iii., Heft 4, 1882), citing a long list of various species of *Ficus* which have afforded evidence of the presence of such inmates; and, in fact, it must be incontestably evident that their name is legion, and their species a multiple of those hitherto recorded, disseminated under divers controlling influences through the lapse of ages, and bursting upon us as startling phenomena from time to time.

When, moreover, we consider the life-history of these diminutive races,—diversified in astounding variety in some of their most remarkable structural characters, while themselves attaining their maximum development within the seed-vessels of a dwarf-fig not exceeding, in many instances, half an inch in diameter, and constituting a little world of its own, which many of its inmates, blind from their birth, are destined never to quit, living in perpetual obscurity within this secluded domicile where organs of vision would be of no avail, but exercising their appointed functions in obedience to a common law regulating the just proportions of each race,—a tale of wonderment is told by these pigmy prodigies which affords a striking illustration of that dictum which our French entomological brethren have adopted as their motto, "*Natura maxime miranda in minimis!*"

In explanation of the fortuitous circumstances aforesaid, I must needs recite the several gradations whereby, almost imperceptibly, step by step, and without any deliberate intention, this federal dependency of the *Cynipidæ*, whilom unchallenged as such, became incidentally transferred to a hostile tribe, whose title—illegitimately acquired, as shown in the sequel—it behoves us to scrutinise, as the first step towards restoring this exiled community to its rightful inheritance.

When Gravenhorst drew attention thereto by his able "*Disquisitio de Cynipe Psene auctorum*," &c. ('Beiträge zur Entomologie,' 1 Heft, Breslau, 1829, p. 27), no other divergent types had been recorded in connection therewith; but, while adverting to the non-existence in his *Blastophaga* of a spiral ovipositor, such as Linnæus ascribed to the *Cynipidæ*, he nevertheless avows that Latreille refers the *Cynips psenes* to that family, and that *Blastophaga* must doubtless be comprised therewith, discarding the idea of any affinity between the latter and the *Chalcididæ*, as defined by Jurine, and stating that his species differed from any of the latter which he had seen, "*capite ovato-orbiculato et vitæ ratione*" (*loc. cit.*, p. 32).

Some years after (1837) Professor Westwood, in his interesting memoir on "Caprification, &c."—when discussing the merits of Dalman's alternative suggestion of a seeming analogy in his *Agaon* with the *Pteromali* and the *Codrini* (*Chalcididæ* and *Proctotrupidæ*), but especially with the former—expressed his opinion "that the curious little groups above described are certainly referable to the *Chalcididæ* rather than to the *Proctotrupidæ*"; adding that "from *all* these insects, however, they are *at once removed by their fruit-feeding habits*, as well as *by various anomalous portions of their structure*, so that I hesitate to name any particular group in that family to which they ought to be considered as most nearly allied" (Trans. Ent. Soc. Lond., vol. ii., p. 223).

Subsequently Dr. Coquerel discovered certain strange-looking fig-insects in the Island of Bourbon, which he characterised as *abnormal parasites*, regarding them as "les femelles aptères et aveugles de quelque mâle ailé et inconnu" (Rév. et Mag. de Zool., 2e série, Tome vii., 1855), these being the now recognised males of winged females, their legitimate partners having been maligned as "*Chalcidites* qui selon toute apparence s'étaient développés à leurs dépens!"

Thus, under the influence of such mistaken identity, a delusive character clung to both sexes of the genuine phytophagous brood; so that Walker, when describing Sir Walter Elliot's specimens from the *Ficus Indica* ('Notes on Chalcidiæ,' 1871), consigned them all to his parasitic races, together with *Blastophaga* and *Sycophaga*, as alike "cradled in figs"—a principle which would not apply to all the inmates of galls—branding his calumniated

Agaonidæ with a felonious impress by placing Coquerel's figures of his "étranges parasites" as emblems and types of the whole, and superadding a tissue of romance on their fabulous affinities.

More recently Professor Westwood, while censuring Walker's peccadilloes, has reiterated his own predilections in favour of such an alliance, though obviously treating them in the aggregate as one joint-stock company, without contemplating the possibility and propriety of a dissolution of partnership between them; for, as he has elsewhere remarked, in speaking of the *Cynipidæ*, "it had always appeared to me contrary to nature that a tribe of *vegetable-feeders* should be arranged in the midst of *parasites*" (Mod. Class., vol. ii., p. 132); nor can it be conceivable that the essentials of structural qualifications should be fashioned in the same guise as equally adapted for germ-feeders and their antagonists. A specious superficial resemblance may, indeed, sometimes obtain between the aggressor and its victim; or, in cases of commensal fellowship, such as that of *Bombus* and *Psithyrus* (Trans. Ent. Soc. Lond., 1882, p. 307), both being *vegetable-feeders*, fraternising in the common banquet provided by the former; but in selecting *Callimome*, of parasitic habits, as the standard of comparison in this instance, there would be no *raison d'être* for such a similitude, no species of this genus having yet been found in these fig-abodes.

Nevertheless, Coquerel's figure of his supposed *Chalcis* (*op. cit.*, pl. x., fig. 4), or that of *Sycophaga* by Professor Westwood in our 'Transactions' (1882, pl. ii., fig. 2), are cited as offering convincing evidence "that the fig species are most nearly related to *Callimome*"; while it is averred that "the structure of the antennæ (even to the minute articulations following the 2nd joint), the fusion of the three terminal joints of these organs, the structure of the wings and wing-veins, and the long exserted straight ovipositor, sufficiently prove that these insects must be placed in the great family *Chalcididæ*" (*ibid*, p. 50).

But, in propounding such a comparison between these parasitic and non-parasitic races, the application of the aforesaid tests to the germ-feeders collectively, or to their two selected representatives respectively, is by no means obvious, especially as regards the character ascribed to the ovipositor; for, although a newly-deve-

loped example of *Sycophaga* has been observed to expand this organ to its fullest extent in order to acquire a proper consistency, after being encircled and cramped within the small dimensions of the pericarp (*loc. cit.*, 1882, pl. ii.), yet it always retains, as in other instances, a curvate tendency in the sequel. Thus in the original description of the genus (Trans. Ent. Soc. Lond. vol. ii., p. 322), we read:—"*Oviductus trisetosus, setis æqualibus, abdominis duplo longioribus, et valde incurvatis*," as represented (*ibid*) in pl. xx., fig, 5 *k*.

Taking, however, these tests *seriatim* (1) the minute articulations delineated by Professor Westwood in the antennæ of the female *Sycophaga* (Trans. Ent. Soc. Lond., 1882, pl. ii., fig. 6), scarcely correspond with any in the same sex of *Callimome*; nor do they occur in *Blastophaga* (*ibid*, pl. v., fig. 51), whose antennæ, moreover, have the 4th joint produced into a long projecting spine, thus differing vastly from those of *Callimome*. The small annuli in the antennæ of the *Eurytomides*, as figured by Curtis in *Decatoma* (Brit. Entom., pl. 345) are also witnessed among some of the fig-insects belonging to the parasitic races, but these differ essentially from the aforesaid articulations in the antennæ of *Sycophaga*; and the presence of such annuli in the alleged vegetable-feeding species of the former would seem to attest their ancestral "Unity of Habits" with others of the same group, however much their appetites may have become chastened by some mysterious dispensation. So also in Dr. Paul Meyer's figure (from Cavolini)* of the supposed female of "*Ichneumon ficarius*" (*loc. cit.*, p. 564, pl. xxv., fig. 5, and pl. xxvi., fig. 13); the male, however, being evidently a *Sycoscapter*, generically distinct from such female, which has a long ovipositor with a tubiform base, as described by Walker in *Idarnes transiens* (*Idarnella*, Westw.).

(2). As regards the fusion of the three terminal joints of the antennæ, this is not a reliable character throughout the germ-feeders, for it does not exist in *Eupristina* (Pl. I., fig. 14), nor in the Madagascar species (Pl. III., figs. 39, 40), both of which have these terminal joints distinctly separated from each other. So likewise in *Agaon*,

* Filippo Cavolini. "Memoria per servire alla storia compiuta del fico e della proficazione." Opuscoli scelti sulle scienze e sulle arti; Tome v., Milano, 1782. (Dr. P. Meyer, *l. c.*, p. 579).

as adverted to by Professor Westwood in his memoir on "Caprification," &c. (*l. c.*, vol. ii., p. 223), the "antennæ are terminated by three very large and *distinct joints*."

(3). The wing-veins also differ *inter se* in the germ-feeders, nor does *Callimome* coincide with *Eupristina* in this respect (Pl. I., fig. 4); while, irrespective of their phytophagous habits, these germ-feeders, in common with their aforesaid representatives, are separated from *Callimome* by other alary incongruities, such as the invariable absence of wings in the males.

(4). Furthermore, the long straight ovipositor is not a distinguishing characteristic of these phytivorous broods, this organ being remarkably *short* in *Blastophaga*, as well as in the Madagascar species (Pl. III., fig. 46); and in all matured examples it maintains the arcuate condition imparted by its original position within the seed-vessel as aforesaid, whether long or short. That this organ should be *exserted* is doubtless essential to the requirements of the race in their mode of oviposition, having, moreover, in some instances, if not in all, to penetrate within the young figs for this purpose, as testified of *Sycophaga* in our 'Transactions' (1878, p. 317), for which purpose a more bulky abdomen, like that of an ordinary *Cynips*, would be ill-adapted, although Latreille surmises that the ova of *Blastophaga* (*Cynips Psenes*, Linn.) are deposited in the pollen at an earlier stage (Cuv., Anim. Kingd., Genus *Cynips*).* Such modified appliances, however, are constantly witnessed, and constitute connecting links between allied races, which may be no less recognised in this instance. Thus, in his incomparable standard work, the 'Modern Classification of Insects' (vol. ii., p. 117), Professor Westwood explains "that the borer of the *Urocerus* is but the saw of the *Tenthredo*, modified to fit it for its functions," the analogy between their structural details and the respective advantages derivable therefrom being also fully discussed. The same remarks apply equally to this implement in *Xiphydria* (*ibid*, p. 121). In *Oryssus* its

* Count Solms-Laubach, by his recent researches at Naples, has ascertained that the female *Blastophagæ*, like those of *Sycophaga*, penetrate into the wild figs for the purpose of depositing their eggs. He frequently found a mass of their wings adhering thereto where many had effected their entrance together, and they subsequently die within. ("Die Herkunft, Domestication, und Verbreitung des gewöhnlichen Feigenbaum; Von H. Graf zu Solms-Laubach." Göttingen, 1882).

structure is still more anomalous, this genus being considered by Dahlbom as constituting the "connecting link" between the "gall-flies" and the "saw-flies" (*ibid*, p. 124), where the phytophagous fig-species may not inappropriately intervene as a primary group of the *Cynipidæ*. The inferences to be deduced from such modifications, where corresponding habits disclose associating links, are well exemplified in the reasons adduced by Professor Westwood for the transfer of the *Urocerida* from the position assigned to them by St. Fargeau; his nomenclature and arrangement being repudiated "because neither appear to have *a foundation in nature*, the precise construction of the ovipositor in his different groups not having been correctly ascertained, whilst we have already seen that there are no grounds for the insertion of the *Urocerida amongst the parasitic insects*" (*ibid*, p. 123). Thus modifications in structure, implying corresponding differences in economy, must not be held to supersede all considerations reposing on physiological facts. In like manner the ovipositor in these germ-consumers was well known to Linnæus when he described his *Cynips Psenes* as "*aculeo* exserto, *sed debili*, *laxo*, *ut vix videatur Cynips esse*"; yet he had no scruple to associate this and Hasselquist's other fig-species with the *Cynipidæ*. Moreover, as compared with *Callimome* (Curtis, *loc. cit.*, pl. 552), the organisation of the terebra in these fig-devotees of the germ-feeding race is essentially different, as emanating from a depressed valve at the base of the 5th segment, thus described by Gravenhorst in *Blastophaga*: "*Terebra setiformi*, *vaginis graciliore*, *situ certo*, *cum nempe infra ventrem reclinatur*, *e valvula ad basin segmenti quinti porrecta*" (*loc. cit.*, p. 29). This valve is shown in my figures 15, 29, and 46.

In fact we are confronted with anomalous ovipositors in all the intervening links between the *Tenthredinidæ* and the *Cynipidæ*; but, in these germ-nurtured fig-voluptuaries, such modifications are not unfrequently emphasised to a remarkable extent in their buccal organs, by those peculiar serrate processes, of marvellous devices, which many of them exhibit as mandibular appendages, having no parallel elsewhere; while, from their inherited instincts, the same ruling must apply to them as to the *Urocerida*—that there are no grounds for the insertion of these vegetarians amongst the parasitic insects. Nevertheless, in comprising the *Cynipidæ* among the "*Entomophaga*," the same exemption from unnatural associates

was not extended to them; while admitting that "if we employ terms founded upon the *habits* of the different families" (as in this instance) "we must introduce the gall-flies amongst the *plant-feeders* (*Phytiphaga*)"—(Mod. Class. ii., p. 124).

With reference to the dentate genital claspers adverted to "as a further illustration of the relationship between some of the fig-insects and other well-known parasitic *Chalcididæ*" (Trans. Ent. Soc. Lond., 1882, pp. 325, 326), I would observe that this character can have no application to tribal distinctions, inasmuch as its presence alike in the germ-feeding *Sycophaga* and in several of its parasitic associates, having no kindred connections therewith, must serve to discountenance any such inference; while the absence of similar retinacula in the corresponding sex of *Callimome* does not enhance its claim to be regarded as allied to *Sycophaga*. This, however, is a character which has been very little studied hitherto, and may be found to have a wider application, irrespective of family associations.

Hence it follows that, whether looking to structural endowments or correlative propensities, these fig-dwellers of the phytophagous broods are in nowise disqualified for their ancestral status by the results of such an ordeal, any more than by their adopted habitat, for, as Hasselquist observes, "*Gallæ locum obtinet hèic ficus*"; the severance of the respective races being readily effected by the light of analogy; or if, indeed, the results thus obtained should in any instance prove fallacious, the remedy is obvious, such liability, however, being of minor import than the inconsistency involved in the promiscuous intermingling of alien races consequent upon an innovation of the last decade, founded on misconception, and irreconcilable with probationary tests.

In reverting, therefore, to their time-honoured kinship, the *Cynipidæ* would be divisible into three subfamilies, (1) the *Sycophagides*, (2) the *Cecidophagides*, and (3) the *Heterophagides*, or aphidivorous *Cynipidæ*,* constituting, as long since suggested by Prof. Westwood (Mod. Class. ii., p. 124), "the connecting link" with the aphidivorous *Braconides*; the hitherto known fig-feeders being tabulated as follows:—

* The tendency of such heteroclites to revert to their ancestral habits is well exemplified in the instance cited by Dr. Harris, and referred to by Prof. Westwood in his 'Memoir' on the "*Eurytomides*" (Trans. Ent. Soc. Lond., 1882, p. 311), when "some of these insects that came from a straw-bed, and were shown to Dr.

CYNIPIDÆ, Westw.

SYCOPHAGIDES.

Division 1. Prionastomata.

BLASTOPHAGA, *Grav.* (Cynips, *Hasselq.*, *Linn.*, *Fab.*, *Latr.*).

Sp. 1. *B. ficus*, Hasselq.; *C. psenes*, Linn.; *B. sycomori*, Westw.

Sp. 2. *B. caricæ*, Hasselq.; *C. psenes*, Linn.

Sp. 3. *B. grossorum*, Grav.

AGAON, *Dalman.*

Sp. 1. *A. paradoxum*, Dalm.

SYCOCRYPTA, *Coquerel.*

Sp. 1. *S. cæca*, Coq.

EUPRISTINA, n. g.

Sp. 1. *E. masoni*, n. s.

PLEISTODONTES, n. g.

Sp. 1. *P. imperialis*, n. s.

KRADIBIA, n. g.

Sp. 1. *K. cowani*, n. s.

Division 2. Aploastomata.

SYCOPHAGA, *Westw.* (Cynips, *Hasselq.*, *Linn.*, *Fab.*).

Sp. 1. *S. sycomori*, Linn.; *C. cycomori*, Hasselq. *S. crassipes*, Westw.

APOCRYPTA, *Coquerel.* (Sycophaga, *Westw.*).

Sp. 1. *A. paradoxa*, Coq.

Sp. 2. *A. perplexa*, Coq.

KRADIBIA COWANI.

This new genus and species has been obtained from some small figs brought to this country from Madagascar by the Rev. W. Deans Cowan, who states that they were found in the Forest of Fianarantsoa, in the south-central district of the island, about four miles from Antananarivo, the capital. Mr. Cowan explains that, so far as he can recollect, "the tree was very high, about nine inches in diameter, and the fruit of a strawberry-red colour, attached to the trunk at nearly the whole

H., had proved very troublesome to children sleeping on the bed, their bites or stings being followed by considerable irritation, which lasted several days; so numerous were the insects that it was found necessary to empty the bed-tick and burn the straw."

height of the tree below the branches, and found in clusters of four and five together."

On inspecting these figs after their arrival it was evident that a portion of the inmates had already effected their egress, though some of the females had died when in the act of emerging from the seed-vessels, several of the apterous males, together with a few of their winged partners, still adhering to the glutinous orifice of the passage whereby others of the brood had escaped, this being the first instance on record in which any of the former have been known to quit the fig. Both sexes are smaller than the European *Blastophagæ*; the males have an obcordate head, with short six-jointed antennæ projecting from the clypeus; their broad trigonate mandibles, bidentate at the apex, forming, when closed, a transverse prominent line in front, and their eyes conglomerate within black triangular maculæ (as seen in balsam slides). The males are remarkable as having only *four* developed legs, the middle pair being obsolete. Traces thereof have, however, been detected under the microscope, in a very rudimentary form, not otherwise perceptible, in some transparent specimens mounted in balsam, consisting of two biarticulate appendages, of minute dimensions, which may be detached in dissected specimens, and which are shown in their natural position, affixed to the posterior margin of the mesosternum, in Plate III., fig. 47. When viewed laterally, as in fig. 32, these quadrupedal males, standing on their short robust legs, with projecting head, are somewhat suggestive of a miniature pachyderm—*si parva licet componere magnis.*

The pronotum is very large, rounded in front and deeply emarginate at the base, with long projecting angles directed backwards; the mesonotum is semicircular and broadly truncate behind; the metanotum is longer than wide, narrower and truncate behind, with the sides rounded. The legs have their femora much distended; those of the first pair are longer and broader than those of the hind legs; the tibiæ of the first are very short, and as wide as long, terminating in two incurvate spines forming a large crescent; their tarsi are biarticulate and robust, with large prominent claws; the hind tibiæ are longer than the fore tibiæ, narrow at the base and truncate at the apex, with two short spurs at each angle and three or four sharp teeth near the apex on the outer margin; their tarsi are 5-

articulate, the basal joints short, the 5th longer, with small claws.

The female has a short ovipositor like *Blastophaga*, from which it diverges in the structure of the antennæ, which have some resemblance to those of *Eupristina* in their terminal joints and setose character; but it differs from the latter in the veining of the wings, which have the cubitus deflexed on the disc, and in its simple 5-serrate mandibular appendages. The head is small and oval, and the mandibles, as well as their appendages, short and broad. The antennæ are ten-jointed, the basal joint large and elongate, narrower at the apex, with an angular distension on the inner side; the 2nd joint longer than broad, and slightly sinuous; the 3rd forming a long, acute, curvate, projecting spine; the 4th is shorter than the 5th; and the 6th to the 9th are cyathiform, densely clothed with coarse recumbent setæ, the 6th being more elongate than the others, and the terminal joint fusiform. Thus in these antennæ the 3rd and 5th joints of other genera are obsolete. The last four joints are also partially retractile at the base and deeply inserted respectively within the apex of each preceding joint, being occasionally expanded to their full extent, thus imparting a versatile character to these organs, both conditions being sometimes exemplified in the same specimen.

The thorax is short and gibbous; the fore wings very elongate, having the post-costal vein widely separated from the costa at its base, but conjoined subsequently, and the cubital vein deflexed on the disc of the wing in a slight outer curve, terminating in an oblong clavate apex. The hind wings have the costa and post-costal vein coalescent and strongly arcuate at the base of the wing, extending obliquely beyond the anterior margin, where terminating in a small tubercle bearing two or three hooklets; the entire disc of all the wings is interspersed with short recumbent setæ, and surrounded with a deep marginal fringe. The fore and hind legs are of moderate dimensions, and the intermediate pair slender and elongate. The abdomen is oval, about equal in length to the thorax; the ovipositor short and setiform, not exceeding one-fourth the length of the former beyond its apex, with the sheaths shorter, robust, and falcate.

The remarkable circumstance of the absence of the middle pair of legs in the males has been consistently

maintained in the many specimens which I have examined, otherwise perfect, coupled with an abnormal development of the fore and hind femora, which closely approximate laterally; their antennæ, with a central conical joint deeply embedded within the next in succession, are also very peculiar; while the four terminal retractile joints of these ten-jointed organs in the females readily serve to separate this sex from any known genus.

Kradibia,* n. g.

Mas apterus. Caput parvum, obcordatum. *Oculi* plus minusve conglomerati. *Mandibulæ* minimæ, trigonæ, recta linea transverse valde porrectæ, apice bidentatæ, dentibus obtusis. *Antennæ* 6-articulatæ, glabræ; articulo basali parvo, obtrigono, 2do magno, subovato, latere interno medio dilatato, apice truncato; 3tio brevi, curvato, dimidio basali constricto; 4to minimo, conico, apice intra 5ti basin profunde inserto; 5to elongato, latitudine duplo longiore, basi apiceque truncato, lateribus subparallelis; extimo (6to) simili sed breviore, apice conico. *Palpi* obsoleti. *Thorax* capite dimidio latior; pronoto magno, antice rotundato, angulis posticis valde productis, acuminatis; mesonoto semicirculari metanoto longiore, postice late truncato. *Pedes* antici breves; coxis parvis, subquadratis angulis rotundatis; femoribus maximis, latis; tibiis brevibus, robustis, apice dilatatis, angulis in spinas acutas, incurvas, valde productis; tarsis parvis, crassis, biarticulatis, articulo 2do longiore; unguibus magnis, basi dilatatis, dente brevi utrinque instructis. *Pedes intermedii* desunt; appendicibus duabus minimis biarticulatis, articulis subrotundis, basali majore, ad mesosternum postice affixis, licet obtectis necnon ob exiguitatem vix detegendis, tantum indicati. (Tab. III., fig. 47). *Pedes postici* coxis parvis oblongis; femoribus ut in anticis latis, parum brevioribus; tibiis longioribus, basi tenuioribus, apice sensim latioribus, truncatis, angulis utrinque bimucronatis, margine externo setis paucis tenuibus, dentibusque obtusis 4 prope apicem, instructis; tarsis 5-articulatis, articulis 1—4 brevibus, apicali duplo longiore; unguibus mediocribus, pulvillis dilatatis. *Abdomen* basi inflatum, subsphæricum, segmentis apicalibus tenuibus, elongatis, sæpe subter truncum retro deflexis.

* κράδη, *ficus sylvestris.*

Fœmina alata. *Corpus* parvum. *Caput* breve, angulis anticis prominulis, longitudinaliter late canaliculatum. *Oculi* ovales, laterales. *Ocelli* invisi. *Mandibulæ* breves, latæ, apice bidentatæ, acutæ, basi subquadratæ, appendicibus basalibus parvis, transverse striatis, latere interno 4-serratis. *Antennæ* 10-articulatæ; scapo magno, oblongo, latere interno prominulo, basi apiceque angustiore; articulo 2do robusto, curvato; 3tio in spinam elongatam, curvatam, acutem, externe producto; 4to parvo, oblongo; reliquis setis crassis elongatis dense vestitis; 5to brevi; 6to, 7mo, 8vo, 9no, magnis, cyathiformibus; extimo (10mo) fusiformi, setis obtecto; articulis ultimis quatuor nonnunquam valde productis, vel singulis sese in antecedentem retractilibus. *Thorax* capite dimidio longior, latitudine coæqualis; pronoto brevi, antice attenuato, postice incurvato; mesonoto transverso, lato; metanoto longiore, postice rotundato. *Pedes antici* validi; coxis elongatis; femoribus longis, robustis, externe rotundatis, latere interno subrectis; tibiis brevissimis, curvatis, apice latis, truncatis; tarsis longis, gracilibus, 5-articulatis; unguibus parvis. *Pedes intermedii* longi, coxis semicircularibus; femoribus elongatis, tenuibus; tibiis longioribus, gracillimis, apice sensim sed parum latioribus, calcare tenui; tarsis longis, filiformibus, 5-articulatis, unguibus parvis. *Pedes postici* coxis robustis, ovatis; femoribus brevibus, vix inflatis, apice tenuioribus; tibiis brevissimis, apice latioribus, truncatis, angulo interno calcaribus duobus validis armatis; tarsis gracilibus, 5-articulatis, articulo basali longiore; unguibus mediocribus. *Alæ* omnes disco setis elongatulis recumbentibus sparsim instructæ, marginibus late fimbriatis; *anticæ* longæ; vena postcostali, basi valida, cum costa coalita, medio divergente, arcuata; vena cubitali in discum deflexa, parum externe curvata, clava oblonga, truncata, oblique terminata. *Alæ posticæ* angustæ, apice subacuminatæ; vena postcostali cum costa conjuncta, arcuata, basi valida, prope marginis mediam externe producta, apice tuberculata setisque deflexis paucis brevibus instructa. *Abdomen* ovale, terebra setiformi, brevi, abdominis quartam partem longitudine vix eccedente; valvulis brevioribus, robustis, arcuatis.

Kradibia cowani, n. s.

Mas capite, thorace, pedibusque fulvis, antennis pallide flavis, abdomine albido. *Fœmina* capite, antennis, thoraceque piceis, pedibus, abdomineque fulvis, alis cinereis, venis fulvescentibus. Long. corp.—mas, 1½ mm.; fœmina, 2 mm. Expans. alar, 3½ mm.

Hab. Cernes insula, Dom. W. D. Cowan cum ficubus communicavit.

In Mus. Britannico et nostro.

A single parasitic species was found in these Madagascar figs, whereof I noticed only two examples. They may be easily confounded with the males of *Kradibia*, being very similar in general appearance; but they are at once recognisable by their fully-developed intermediate legs and other structural characters, being also prominently palpigerous, with conglomerate eyes. They constitute a new species of *Sycoscapter*, the description of which is hereto appended.

Sycoscapter gibbus, n. s.

Characteres e maribus descripti.

Fulvescens, apterus, Kradibii mares simulans; capite elongato, prominulo, basi rotundo; oculis conglomeratis; mandibulis crassis, longis, subrectis, apice obtusis sursum curvatis; palpis maxillaribus longulis, infra prominulis, articulis duobus apicalibus parvulis, extimo seta longa instructo. Antennæ structuræ solitæ in hoc genere, pallide flavæ. Alæ rudimentariæ nullæ. Pedes antici robusti, femoribus magnis, subovatis; tibiis brevibus, apice multispinosis; tarsis 5-articulatis, articulis 4 basalibus flavescentibus, brevissimis, latis, oblique compressis, sinuatis, extimo rufo-piceo, magno, elongato, basi tenui, apice lato, rotundato, unguibus, pulvillisque majusculis. Pedes intermedii similes sed minores, cætera ut in anticis. Pedes postici majores, femoribus magnis, ovatis; tibiis longioribus, curvatis, basi constrictis, apice late truncatis, margine antico latereque externo spinis plurimis validis instructis; tarsis ut in anterioribus sed majoribus, unguibus pulvillisque elongatis. Long. corp. 1½ mm.

Hab. Cernes insula, cum *Kradibia cowani* in ficubus ipsis commixti.

In Mus. Britannico et nostro.

Explanation of Plates.

PLATE I.

Fig. 1. *Eupristina masoni*, male, magnified.
2. Retractile apex of abdomen of ditto.
3. The male, seen laterally, with the abdominal segments extended.
4. The female, magnified.
5. The head of ditto, seen laterally.
6. Mandible of the male.
7. Antenna of ditto.
8. Fore leg of ditto.
9. Coxa of the same.
10. One of the mandibles of the female, seen from below, with its serrate basal appendage and appendiculated serrate lateral lobe.
11. The same, seen obliquely, showing the seven teeth of the lateral lobe, and the eleven teeth of the principal appendage.
12. The same, seen more obliquely.
13. The same, seen transversely, showing the duplex series of teeth.
14. Antenna of the female.
15. Abdomen and ovipositor of ditto.

PLATE II.

16. *Pleistodontes imperialis*, male, with abdomen fully extended, magnified.
17. The female, magnified.
18. Head and prothorax of ditto, seen laterally.
19. Mandible of the male.
20. Antenna of ditto.
21. Upper horizontal section of head of ditto.
22. Lower section of ditto.
23. Fore leg of the male.
24. Mandible of the female, with its multiserrate basal appendage seen from below.
25. The same, seen transversely.
26. Antenna of the female.
27. Middle leg of ditto.
28. Hind leg of ditto.
29. Abdomen and ovipositor.
30. The ovipositor, extracted.

PLATE III.

FIG. 31. *Kradibia cowani*, male, magnified.
32. Ditto, seen laterally.
33. The female, magnified.
34. Head of ditto, seen laterally.
35. Mandible of the male.
36. Antenna of ditto.
37. Mandible of the female, seen from below.
38. Ditto, seen transversely, showing the 5-serrate basal appendage.
39. Antenna of the female, with the terminal joints contracted.
40. The five terminal joints of ditto, naturally expanded.
41. Anterior portion of fore wing of the female.
42. Hind wing of ditto.
43. Fore leg of ditto.
44. Middle leg of ditto.
45. Hind leg of ditto.
46. Abdomen and ovipositor of ditto.
46*a*. Apex of ventral valve.
47. Minute rudiments of middle legs of the male, as found *in situ*.

II. *Further descriptions of insects infesting figs.*

By J. O. Westwood, M.A., F.L.S., &c.

[Read October 4th, 1882.]

Plates IV.—X.

The insects described in the present communication infest the fruit of *Ficus Indica* in Hindostan, having been found at Madras in the months of December, 1856, -7, -8, and -9, by Sir Walter Elliott, who caused a series of magnified figures of several of the species to be made by his native artist, which drawings were placed in my hands by the late Mr. Frederick Smith. The types of these insects are now in the British Museum, and were described by Mr. F. Walker in his 'Notes on Chalcidiæ.' Mr. J. Wood-Mason, at Calcutta, also found a number of these parasites in the fruit of the same species of *Ficus*, which he communicated to Sir Sidney S. Saunders, who has placed most of them in my hands for investigation and description, which I have now the pleasure of presenting to the Entomological Society by way of supplement to my two former memoirs on fig-insects, and to those of Sir S. Saunders.

A very unsatisfactory series of descriptions of other fig-insects, by Mr. F. Walker, was published posthumously in the 'Entomologist,' vol. viii., p. 15; 1875. The paper is entitled "Descriptions of new Genera and Species of Parasites belonging to the families *Proctotrupidæ* and *Chalcididæ*, which attack insects destructive to the fig in India," and contains descriptions of *Pseudisa* (n. g., fam. *Dryinoidæ?*), *P. smicroides*; *Isanisa* (n. g., fam. *Eurytomidæ*), *I. decatomoides*; *Agrianisa* (n. g., fam. *Sycophagoidæ*), *A. myrmecoides*; *Micranisa*, n. g. (neither family nor species mentioned); *Polanisa*, n. g. (allied to *Idarnes*), *P. lutea*; *Idarnes orientalis* (with the remark that "the only species hitherto described is a native of the West Indies") [*I. Carme*,] which shows either that Mr. Walker wrote these descriptions before 1871, when he published the fourth part of his 'Notes

on Chalcidiæ,' or that he had forgotten his descriptions of *Idarnes transiens*, *stabilis*, and *Pteromaloides*, which had appeared in that work; whilst, had he previously written these 'Entomologist' descriptions, it is curious that he did not allude to them in his 'Notes.' No collection is named in which the types of these descriptions exist, nor is any notice given by whom they were collected, and I am informed that the box in which they were placed has disappeared.

Another memoir on fig-insects, by Dr. Paul Mayer, has just appeared in the 'Mittheilungen a. d. Zoolog. Station zu Neapel, 1882,' Heft iv. It extends to forty large 8vo pages, and is accompanied by several plates and woodcuts; and reference to a memoir by H. Graf zu Solms-Laubach, entitled "Die Herkunft, Domestication und Verbreitung des gewöhnlichen Feigenbaums (*Ficus carica*, L.)," published in the 'Abhandlungen Kön. Gesellschaft der Wissenschaften zu Göttingen,' 1882, 106 pp. In this memoir (which well deserves translation) Dr. Mayer has dwelt at length on the physiological effect of the presence of the fig-insects in causing capri fication, and has given a list of the twenty-two different species of *Ficus* and *Sycomorus* from various parts of the world which have afforded species of these fig-insects.

Dr. Mayer's memoir is terminated by extended descriptions and figures of the details of both sexes of *Blastophaga grossorum*, Grav.; of the male of *Sycophaga Sycomori* (*S. crassipes*, Westw., *olim*); and of two other insects which (evidently deceived by the analogy with the sexual differences of *Blastophaga grossorum*) he describes (pp. 554 and 564) as the two sexes of one species under the provisional name of *Ichneumon ficarius*, Cavolini. One of these two insects is a female with a very long exserted ovipositor, and is either identical with or congeneric with Walker's *Idarnes transiens*; and the other, a supposed male, is a subapterous insect which, judging from the figures, seems to me to be identical with the female of *Sycoscapter insignis* described below.

SPECIES OF INSECTS INFESTING *FICUS INDICA*.

Sycobia, *Walker*. ('Notes on Chalcidiæ,' p. 60).

Characteres e maribus tantum descripti. Corpus gracile subplanum, fere glabrum. Caput magnum, oblongo-quadratum lateribus subparalellis, angulis posticis rotundatis, disco subplano; oculis ovalibus, fere in medio laterali positis; ocellis tribus posticis; clypeo in medio biimpresso; antennis basi valde approximatis, in medio clypei insertis; capite vix longioribus, articulo 1mo longo, simplici, ad apicem sensim sed paullo incrassato; 2ndo fere dimidium articuli 1mi æquanti; articulis sex sequentibus brevibus, fere æqualibus, ultimo (9mo) oblongo-ovato, quasi sed indistincte 3-articulato. Mandibulæ elongatæ graciles, falcatæ, apice acutæ bifidæ. Maxillæ et labium coalitæ carnosæ porrectæ, palpis maxillaribus 4-articulatis, articulo 1mo crasso, 2ndo et 3tio cylindricis, ultimo parvo subulato, seta rigida terminato; palpis labialibus minutis, ut videtur, exarticulatis, apice seta terminatis. Thorax oblongo-ovalis antice parum angustatum. Pronotum magnum semiovale, sc. subconicum. Scutellum rhomboideum. Metathorax sat magnus. Alæ satis magnæ, anticæ vena tenui, subcostali basali, ad apicem cum costa breviter coalitæ, vena cubitali gracili in discum alæ deflexa, apice parum incrassato; posticæ venis obsoletis. Pedes modice elongati, forma normali, femoribus anticis et posticis subincrassatis; pedibus intermediis gracilioribus et parum brevioribus; tarsis omnibus 5-articulatis, unguibus crassis pulvillo magno instructis. Abdomen vix thoracis longitudine sed latius, subovale, subdepressum; segmento 1mo (pedunculo) squamiformi metanoto angustiori, subplano, angulis posticis subacute productis, margine postico in medio emarginato; segmento 2ndo lato, basi biimpresso; genitalia porrecta elongata depressa parte basali oblonga, retinaculis duabus, 3 dentatis, instructa; parte apicali basi angusta, apice dilatato, caudam piscis simulante, stylis duobus elongatis dorsalibus in tuberculum parvum carnosum terminatis.

Variat secundum magnitudinem individuorum magnitudine mandibulorum. Figura 8 caput individui parvi representat mandibulis clausis et multo brevioribus.

Typus *Sycobia bethyloides*, Walker (*loc. supra cit.*). (Pl. IV., figs. 1—8).

Lutea, mandibulis fulvis, abdomine fulvo apice pallide testaceo, alis diaphanis venis pallide testaceis. Long. corp. $1\frac{1}{3}$—$2\frac{1}{2}$ lin.

Hab. Hindostan. In *Ficus Indica*, Calcutta; Sir Walter Elliott and J. Wood-Mason. In Mus. Britann. et S. S. Saunders.

My description of this insect is made from the type-specimens described by Walker, still in the British Museum; and by the permission of Dr. Günther, the chief of the Zoological Department, I have been enabled to make a careful microscopical examination thereof, assisted by several other specimens, received by Sir Sidney S. Saunders from Mr. Wood-Mason, found by him infesting *Ficus Indica* at Calcutta. This has enabled me to ascertain that the specimens described by Walker as females, provided with an exserted ovipositor, are in fact males, with the genitalia exserted to a considerable length, this peculiarity having been observed in all the specimens which I have examined.

On comparing my description with that given by Walker of his misnamed female of *Sycobia bethyloides*, it will be seen that that author overlooked the ocelli, and has described the exserted male genitalia as "*oviductus* tubiformis, abdominis dimidio æquilongus."

Walkerella, n. g.

(*Sycobia*, "neuter? worker?," Walker, 'Notes on Chalcidiæ,' p. 61).

Characteres masculini tantum descripti. Corpus parvum breve apterum. Caput magnum depressum transverse ellipticum, angulis rotundatis; pronoto latius; oculis parvis lateralibus, margine antico capitis in medio parum depresso. Ocelli 0. Antennæ in medio capitis insertæ, basi approximatæ, articulo 1mo maximo dilatato, basi angustato, 2ndo parvo angusto, 3tio subclavato annuliformi, 5 proximis minutis æqualibus, ultimo (nono) præcedenti paullo majori ovali, et ut videtur exarticulato. Mandibulæ elongatæ, porrectæ falcatæ, basi dilatato et denticulato, apice bifidæ. Trophi reliqui obsoleti. Pronotum magnum capite angustius transverso-quadratum; mesonotum exarticulatum?; transversum; metanotum

angustius parum transversum, postice rotundatum. Abdomen angustum, thoracis longitudine, apice genitalibus stylum gracilem formantibus, prope apicem retinaculis duobus 4 dentatis (cercis apicalibus, *Walker*), instructis. Pedes satis elongati et graciles, intermedii parum minores, femoribus anticis paullo incrassatis; tibiis subdilatatis; tarsis omnibus articulis 5 sat gracilibus instructis.

Typus *Walkerella temeraria*, n. s. (mas). (Pl. IV., figs. 9—12).

(*Sycobia bethyloides*, "neuter? worker?," Walker, *op. cit.*, p. 62).

Testacea lutea, mandibulis fulvis. Long. corp. 1 lin.

Habitat in *Fico Indica*, Hindostan (Sir W. Elliott). In Mus. Brit. et Hopeiano Oxoniæ.

This male insect, which Walker rashly described as the neuter or worker of *Sycobia bethyloides* (unmindful of the physiological considerations involved in the adoption of such a term) differs from *Sycobia* in its apterous condition, the structure and place of insertion of the antennæ, the want of maxillæ and other inferior parts of the mouth, and the structure of the parts of the thorax.

The shape of the head and the position of the antennæ, with the simple 5-jointed tarsi, will also distinguish this insect from any of the other apterous or subapterous species subsequently to be described in this memoir.

Sycobiella, n. g.

Characteres e mare descripti. Corpus minutum apterum vel subapterum. Caput magnum, thorace latius angulis anticis obliquis; margine postico capitis in medio emarginato et utrinque in angulum parvum producto. Oculi laterales triangulares; clypeus vel margo anticus capitis emarginatus. Antennæ sublaterales prope marginem internum oculorum insertæ, articulo 1mo maximo, plano, subquadrato, basi extus rotundato, intus profunde inciso; 2ndo parvo obconico paullo curvato, 3tio minuto annuliformi, 4to ad 8vum parvis subæqualibus, singulo extus incisione parva subapicali notato; 9no ovali vix articulato. Mandibulæ robustæ trigonæ apice curvato bifido, parte supera apicis supra

truncata (quasi dente altero truncato armatæ). Trophi reliqui obsoleti. Prothorax magnus transversus, planus, lateribus rotundatis; meso- et metathorax brevibus angustioribus. Alæ anticæ (saltem in maribus) rudimentariæ, prope angulos anticos mesothoracis insertæ, stylum longitudine pronoti, sensim ad apicem attenuatum, subarticulatum et longe setigerum, formantes. Pedes breves valde incrassati, tibiis anticis subtrigonis apice spinosis, tarsis brevibus crassis ut videtur 3-articulatis, articulis duobus basalibus brevissimis; tibiis intermediis vix crassitudine dimidium tibiarum anticarum æquantibus; tarsis ut videtur 4-articulatis, articulis 3 basalibus brevissimis, pulvillo permagno. Abdomen parvum subovale apice styligero, retinaculis in maribus elongatis apice curvalis 3-dentatis. Fœmina mihi invisa.

Sycobiella Saundersii, n. s. (Pl. V., figs. 13—19).

Pallide luteo-fulva; oculis nigris, mandibulis apice et medio clypei castaneis. Long. corp. fere 2 mm.

Habitat in India orientali, Calcutta, in *F. Indica*, D. Wood-Mason. In Mus. S. S. Saunders.

The form of the short, strong mandibles, the remarkably dilated basal joint of the antennæ inserted at the sides of the head near the inner margin of the black eyes, and the curious rudimentary pair of alary appendages, distinguish this insect from the other apterous or subapterous fig-insects.

Sycoscapter, *S. S. Saunders MSS.*, n. g.

Corpus parvum in utroque sexu, apterum vel subapterum. Caput magnum thorace latius et fere ejusdem magnitudine subconvexum, angulis anticis subacutis, et truncatis; posticis densim rotundatis, margine postico capitis emarginato; lateribus rotundatis parce setosis. Mandibulæ crassæ curvatæ, porrectæ, apice acuto integro, intus prope medium denticulo parvo instructæ, basi extus valde incisæ. Maxillæ, saltem in fœmina, parvæ, lobo apicali obtuso setoso, basi utrinque lateraliter, ut videtur, squama oblonga defensæ; palpis maxillaribus 4-articulatis, articulo 2ndo majori, apicali subulato seta terminato; mentum obovale, fere longitudine

maxillarum, palpis labialibus parvis biarticulatis, articulis fere æqualibus, apice seta longa terminato. Antennæ breves, basi valde approximatæ et in medio antico clypei insertæ; articulo 1mo longo, parum incrassato, vix dilatato, 2ndo præcedenti dimidio breviori, 3tio minimo annuliformi; 4to brevi cyathiformi, 5to ejusdem formæ at minori, 6to 7mo et 8vo, fere æqualibus et præcedenti (5to) paullo majoribus, reliquis tribus massam ovalem majorem formantibus. Thorax oblongus subovalis depressus. Pronotum magnum angulis anticis rotundatis. Mesonoto et metanoto brevibus, singulo lateribus rotundatis. Alæ anticæ (in utroque sexu?, certe in fœmina) rudimentariæ, thoracis longitudine, e filamento tenui, cylindrico multiarticulato formatæ. Alæ posticæ obsoletæ. Pedes breves crassi, coxis magnis squamiformibus; femoribus dilatatis; tibiis crassis clavatis, apicibus acute multi-spinosis, tibiis anticis subtrigonis, intermediis ovalibus basi angustioribus, posticis longioribus curvatis extus serie denticulorum circiter 12 armatis. Tarsis omnibus crassis brevibus et 5-articulatis, articulis 4 basalibus brevissimis obliquis, 5to maximo incrassato; unguibus crassis, basi intus acute dilatatis. Abdomen oblongo-ovatum, postice attenuatum; genitalibus maris exsertis, retinaculis duobus tridentatis.

Sycoscapter insignis, S. S. Saunders MSS. (Pl. V., figs. 20—29).

Totus pallide luteo-fulvus nitidus, capite magis fulvo, mandibulis magis castaneis. Long. corp. circ. 2 mm.

Habitat in India orientali, Calcutta, in *F. Indica*, D. Wood-Mason. In Mus. Saunders et nostr.

The general similarity in form in the two sexes of this insect, the acute apex of the rather short and robust mandibles, pointed at the tips, the existence of maxillæ, labium and palpi, at least in the females, the place of insertion and structure of the antennæ, the short strong and nearly equal-sized legs, 5-jointed tarsi, and the very remarkable structure of the rudimentary pair of wings, which I have only noticed in the females, attached near the anterior lateral angles of the mesothorax, distinguish this genus from the other apterous or subapterous species of these fig-parasites.

Sycoscaptella, n. g.

Characteres e mare descripti. Corpus parvum, apterum, depressum. Caput magnum pronoto paullo latius, subdepressum angulis posticis rotundatis dense setigeris; oculis sublateralibus reniformibus antice attenuatis; ocellis 0; antennæ capite breviores, basi approximatæ in medio clypei insertæ; articulo 1mo magno depresso subclavato, 2ndo parvo, 3tio fere indistincto, 5 sequentibus brevibus, inter se subarcte applicatis, ultimo breviter ovato in medio quasi 2-articulato. Mandibulæ parvæ apice acuto integro; palpi distincti, maxillares breves, 4-articulati, articulis duobus intermediis paullo majoribus. Prothorax magnus subplanus, angulis anticis rotundatis; mesothorax transversus, angulis, anticis paullo lobatis; metathorax brevis. Alæ 0? Abdomen basi latitudine metanoti æquale, lobo medio semiovali antice producto; retinaculis maris elongatis subclavatis tridentatis. Pedes breves crassi, femoribus anticis dilatatione basali cum trochantere continua; tibiis anticis perbrevibus subtrigonis apice spinigeris, tibiis intermediis parum angustioribus; tibiis posticis augustioribus spinigeris; tarsis perbrevibus ut videtur 3-articulatis, articulis duobus basalibus in pedibus anticis extus dilatatis setas longas nonnullas emittentibus.

Sycoscaptella affinis, n. s. (Pl. VI., figs. 30—35).

Tota pallide lutea, mandibulis castaneis, pedibus fulvis. Long. corp. 2 mm.

Habitat in India orientali, Calcutta, D. Wood-Mason, in *F. Indica*. In Mus. S. S. Saunders.

This insect is closely allied to *Sycoscapter* in the insertion of the antennæ closely together in the middle of the clypeus, but the joints of the clava of these organs are continuous and not cyathiform, and the formation of the legs, and especially of the tarsi, differs from that of *Sycoscapter*. I was not able to observe any rudimentary alary appendage in the only specimen I have seen, which has been mounted in Canada balsam by Sir Sidney S. Saunders.

IDARNELLA, n. g.

Idarnes (*pars*), Walker, 'Notes on Chalcidiæ,' p. 62.

The genus *Idarnes* was proposed by Walker (Ann. Nat. Hist., xii. 47) for the reception of a minute female chalcidideous insect from St. Vincent's, West Indies (*I. carme*), with extremely long ovipositor and slender body, the palpi being described in that species as biarticulate; the antennæ short and clavate (the number of joints not being indicated), the 1st joint long and thick, the 2nd cyathiform, the 3rd and following very short; the prothorax large and transverse; the abdomen as "longi-ovatum," with the 1st segment large; the oviduct very long, the vaginæ being thrice the length of the body; the femora of the fore and hind legs thick, the middle legs being "graciles."

The type, *Idarnes carme*, is brassy green, with the abdomen cupreous, antennæ black, legs fulvous, eyes and ocelli red, oviduct fulvous, sheaths black.

Idarnella transiens,* Walker (*op. cit.*, p. 62). (Pl. VI., figs. 36—42).

The species which is represented in the accompanying figures inhabits Hindostan and Ceylon, and is distinguished by a rather large head, long slender antennæ in both sexes, the basal joint being long and not clavate, the 2nd joint about one-fourth of the length of the preceding, the 3rd small and annular, the four following equal sized, each rather longer than the 2nd, and the 9th, 10th, and 11th forming a long articulated mass, pointed at the tip. The prothorax is rather small and conical. The fore wings have an elongated deflexed vein. The abdomen of the male is armed with two 3-dentate retinacula, whilst that of the female is terminated by a long slender cylindrical joint as long as the whole of the preceding portion of the abdomen, and this is succeeded by another still more slender cylindrical joint, from the extremity of which arise the two sheaths of the very elongate ovipositor (thickened at their extremities), the ovipositor itself being extremely slender and hair-like.

* The typical specimen of *I. carme*, in the British Museum, has unfortunately lost its head.

The following characters of *Idarnes*, as described by Walker, seem sufficient to separate this insect generically from the type of the genus, *I. carme* (for the former of which I propose the name of *Idarnella*). The antennæ are clavate, 10-jointed, the 1st and 2nd joints long and slender, the 3rd and following short and transverse; the prothorax elongate-conical; the abdomen lanceolate, a little longer than the thorax; oviduct setose, much more than twice the length of the body, tubiform, and like the body in colour towards the base; sheaths black, and with the usual structure from thence to the tip, the tubiform part as long as the abdomen. Legs short, stout; coxæ long; fore femora incrassated, four posterior femora slightly incrassated; tibiæ with two apical spines.*

Idarnes stabilis, Walker (*op. cit.*, p. 62), also reared from *Ficus Indica* by Sir W. Elliott, is described by Walker as golden green, much like *I. transiens* in structure, with the sheaths of the oviduct black, thrice the length of the body, with the usual structure, not tubiform towards the base. I presume from the latter character that *I. stabilis* agrees with *I. carme* generically.

Idarnes pteromaloides, Walker (*op. cit.*, p. 63), also infesting *Ficus Indica* and discovered by Sir W. Elliott, is described as golden green, with 9-jointed ? subclavate antennæ, inserted near the mouth, with the club fusiform, longer than the two preceding joints together; the prothorax somewhat elongate; the mesothorax rather small, with the sutures of the parapsides indistinct; the abdomen convex, with four segments a little longer, broader, and deeper than the thorax, terminating in a lanceolate black tube, which is about one-sixth of the whole length. Wings pellucid; veins very pale yellowish; ulna much shorter than the humerus; radius shorter than the ulna, cubitus shorter than the radius, descending abruptly to the disk; stigma small. It has not the long oviduct which distinguishes the other species of the genus, which character alone, in my opinion, sufficiently separates it generically from the

* *I. transiens*, fœm.—"Lutescens, caput transversum; antennæ fuscæ, 10-articulatæ basi pallide flavæ; prothorax longi-conicus petiolus brevissimus; abdomen lanceolatum, thorace paullo longius; oviductus corpore plus duplo longior, basi tubiformis; femora subincrassata; alæ diaphanæ venis pallide flavis." Long. corp. 1 lin.

other *Idarnes*, as well as *Idarnella*; but it possesses other characters, not noticed by Walker, which will be described and figured in a future paper, in which also detailed descriptions and figures of *Sycophila megastigmoides* and *decatomoides* (Walker, *op. cit.*, p. 64), also found by Sir W. Elliott infesting *Ficus Indica*, will be given.

SPECIES OF INSECTS INFESTING THE SEEDS OF *FICUS RELIGIOSA* IN CEYLON.

I am indebted to the great care and attention bestowed on the investigation of the species of hymenopterous parasites infesting the seeds of figs of various kinds in Ceylon by the late Dr. G. H. K. Thwaites, of the Botanic Gardens at Paradenyia, and by J. Stainforth Green, Esq., of Colombo, for specimens of a great number of distinct species preserved both in spirits of wine and mounted in Canada balsam.

The species of figs observed to be infested with these little parasites in Ceylon are—1, *Ficus* (*Urostigma*) *religiosa*, Linn.; 2, *F. asperrima*, Kœnig.; 3, *F.* (*Covellia*) *glomerata*, Willd.; 4, *F.* (*Urostigma*) *laccifera*, Roxb.; 5, *F.* (*Urostigma*) *Tjiela*, Roxb.; 6, *F.* (*Urostigma*) *Mysoriensis*, Roxb.; 7, *F.* (*Urostigma*) *infectoria*, Willd.; 8, *F. parasitica*, Kœnig; 9, *F.* (*Covellia*) *oppositifolia*, Willd.; 10, *F. heterophylla*, Roxb.; 11, *F. Wightiana*; 12, *F. modesta*; and 13, *F. cinerascens*.

As the fruit of most of these species of *Ficus* is infested with a number of distinct parasites of very minute size, often under a line in length, their microscopical investigation will occupy considerable time, and must form the subjects of partial publication from time to time. On the present occasion I describe some of those infesting *Ficus religiosa*:—

Otitesella, n. g.

Characteres masculini descripti. Corpus minutum subdepressum subapterum. Caput oblongum parum convexum, angulis posticis rotundatis, margine antice in lobos duos rotundos supra basin mandibularum porrecto. Oculi laterales versus angulos anticos capitis positi. Ocelli 0. Mandibulæ magnæ porrectæ, fere

capitis longitudine, apice acuto curvato et supra denticulo truncato instructo; margine interno mandibularum dente latiori truncato pone medium armato. Maxillæ et labium ut videtur obsoleta. Antennæ longiores in medio partis posticæ capitis insertæ, articulo 1mo magno ovali compresso, 2ndo mediocri (annuli pone 2um obsoleti), 5 sequentibus parvis fere æqualibus, ultimo fere 2di magnitudine, ovali, ut videtur ex annulis tribus (2us apicalibus minutis) formato. Thorax oblongo-quadratus, prothorace magno, mesothorace transverso, versus angulos anticos utrinque ala rudimentaria instructo. Pedes valde robusti, omnibus subæqualibus, femoribus magnis ovalibus compressis; tibiis robustis, anticis apice spinigeris; posticis 4 extus rotundato-dilatatis; apice interno calcaratis; tarsis magnis articulis tribus brevissimis, 4to apicali maximo, unguibus robustis basi dilatatis. Abdomen basi metanoti latitudine, apice attenuato, genitalibus utrinque retinacula denticulata armatis.

The general form of the body in this genus closely resembles that of the males of *Sycoscapter*, but the structure of the mandibles, the position of the antennæ, and the form of the alary rudiments and tarsi separate it from the other subapterous groups of fig-insects.

Otitesella digitata, n. s. (Pl. VII., figs. 43—51).

Mas. Tota fulva; mandibulis margine interno in medio rotundato emarginatis, tarsis omnibus articulo 4to maximo ovali et in pedibus 4 posticis nigro, retinaculis 4 denticulatis; alis rudimentalibus e stylo tenui biarticulato apice longe-setigero et vix mesonoto longiori formatis. Long. corp. circ. 2 mm.

Habitat in *F. religiosa*, in insula Tabrobana (DD. Thwaites et J. Stainforth Green). In Mus. Hopeiano Oxoniæ.

The singularly dilated large-sized terminal joint of the tarsi and alary appendages distinguish this species from every other known hymenopterous insect.

Otitesella religiosa, n. s. (Pl. VII., figs. 52—57).

Mas. Parva. Tota luteo-fulva; subaptera, capite subquadrato, angulis anticis et posticis rotundatis; pronoto transverso, breviori, subquadrato, angulis posticis setis nonnullis longis instructis; alis duabus rudimentariis

longitudine pronoti, e filamento tenui cylindrico 6-articulato formatis, articulis 4 ultimis seta longa extus instructis; abdomine basi metanoto angustiori; pedibus brevibus, robustis, tarsorum articulis tribus basalibus brevibus, ultimo crasso, subclavato; mandibulis robustis, porrectis apice acutis, extus ante apicem dente truncato instructis; margine interno in medio in lobum latum planum intus dilatato; retinaculis latis 5 dentatis. Long. corp. circ. 2 mm.

Habitat in *F. religiosa*, in insula Taprobana (DD. Thwaites et J. Stainforth Green). In Mus. Hopeiano Oxoniæ.

Sycoscapter monilifer, n. s. (Pl. VIII., figs. 58—62).

Totus luteo-fulvus. Apterus, capite magno subquadrato, antice paullo angustiore, angulis anticis recte truncatis, posticis rotundatis et pronoto parum latioribus; lateribus serie tuberculorum 16 parvorum singulo seta instructo; antennis parvis in medio clypei basi approximatis; articulo 1mo magno clavato, 2ndo fere dimidium longitudine primi æquanti, 3tio cyathiformi intus paullo extenso, 4to minuto, 5to, 6to, et 7mo parvis æqualibus, reliquis massam ovalem exarticulatam? formantibus; oculis lateralibus versus angulos anticos capitis positis: mandibulis porrectis mediocribus apice integro acuto; dente truncato sub apicem armatis; margine interno parum curvato, denteque basali instructis (maxillis labio palpisque haud observatis). Prothorace semiovali, angulis anticis rotundatis, capite parum angustiori angulis posticis subacutis, singulo seta valida porrecta instructo; alarum rudimentis non detectis; abdomine attenuato, thorace breviori, apice in stylum tenuem terminato, retinaculis non detectis; pedibus satis robustis; tibiis posticis apice parum clavatis, tarsis gracilibus 5-articulatis articulo 1mo elongato, subtus apice parum dilatato setoso, pedibus intermediis femoribus tibiisque crassioribus. De sexu nihil constat. Long. corp. circ. 2 mm.

Habitat in *F. religiosa*, in insula Taprobana. (DD. Thwaites et J. S. Green). In Mus. Hopeiano Oxoniæ.

Sycoscapter gracilipes, n. s. (Pl. VIII., figs. 63—66).

Mas. Præcedenti valde similis, totus luteo-fulvus, differt capite angulis anticis rotundatis, mandibulis falcatis apice acuto denteque oblique truncato sub apicem

armatis, maxillis labio palpisque, ut videtur, obsoletis; pronoto angulis posticis seta porrecta instructis; mesonoto absque rudimentis alarum; abdomine thorace minori, apice attenuato; genitalibus retinaculis 2, 4-denticulatis armatis; pedibus subelongatis tarsis simplicibus 5-articulatis, articulo 1mo in pedibus posticis tribus sequentibus simul sumptis fere æque-longo; an mas speciei præcedentis? Long. corp. fere 2 mm.

Habitat in *F. religiosa*, in insula Taprobana. (DD. Thwaites et J. S. Green). In Mus. Hopeiano Oxoniæ.

Sycoscaptella? anguliceps, n. s. (Pl. IX., figs. 67—75).

Mas. Minuta, luteo-fulva; capite oblongo-quadrato, lateribus parallelis setis tribus longis instructis, margine antico fere recto angulis anticis rotundatis, posticis in angulum parvum extus porrectum productis; oculis versus angulos anticos positis; antennis parvis, basi in medio clypei approximatis; articulo 1mo elongato apice incrassato, 2ndo ovali (annulis sequentibus haud detectis) articulis 5 proximis parvis 2ndo minoribus, ultimo (8vo) ovali integro; mandibulis parvis falcatis apice acutis integris, maxillis labio et palpis, ut videtur, obsoletis; thorace oblongo, aptero, prothorace magno, meso- et meta-thorace majori, abdomine postice attenuato, genitalibus retinaculis 2us angustis curvatis armatis; pedibus mediocribus, tarsis 5-articulatis, pedum 4 anticorum articulis simplicibus, tribus basalibus, in anticis brevissimis, in intermediis brevibus, 5to longitudine præcedentibus simul sumptis æquali, unguibus crassis basi dilatatis; tibiis pedum posticorum calcari longo apicali tarsisque difformibus et ut videtur 5-articulatis, articulo 1mo oblongo subtus serie duplici spinarum parvarum, setaque longissima apicali armato, articulo 2ndo parvo sub apicem præcedentis abscondito, 3tio minuto, 4to brevi setis circiter 4 longissimis apicalibus instructo, articulo ultimo crasso oblongo ovato, unguibus basi dilatatis pulvilloque ordinario armatis. Long. circ. 2 mm.

Habitat in *F. religiosa*, in insula Taprobana (DD. Thwaites et J. S. Green). In Mus. Hopeiano Oxoniæ.

In addition to the preceding species of fig-insects infesting *Ficus religiosa*, I have received the following additional species, parasitic on the same plant, which will require description;—

1. Both sexes of a species of *Blastophaga*, of which the antennæ of the female are strongly clavate with the terminal joints armed with very strong compressed bristles.

2. A female *Idarnella* of comparatively large size; two individuals of a green colour, and one fulvous.

3, 4. Females of two species (*Idarnes ?*) with ovipositors much longer than the body, and of the ordinary structure; one pitchy coloured on the back, with the legs and under side pale yellow; the other rather larger, pale yellow, with the abdomen banded with dark brown, and the outer sheath of the ovipositor setose throughout its whole length.

5. A large fulvous-winged female, like an *Eurytoma*, with unspotted wings.

6. A small, winged, brassy-green, polished species, with the ovipositor not exserted.

7. The winged male of a very small fulvous species, with large black eyes, possibly the male of an *Idarnes* or *Idarnella*.

I add to the preceding descriptions of species infesting the seeds of *Ficus Indica* and *religiosa* the description of another species which infests *Ficus asperrima* in Ceylon, and which seems to be identical with the male insect described by Dr. P. Mayer as the male of *Ichneumon ficarius* (Mitth. d. Zool. Station z. Neapel, vol. iii., pl. xxv., fig. 2; and pl. xxvi., figs. 1, 2, 6 and 8), but which has no relationship with the insect figured by him as the *Ichneumon ficarius* female, which is an *Idarnella*; whereas the present insect appears to belong to my genus *Sycoscaptella*, and is remarkable for possessing four rudimentary alary appendages.

Sycoscaptella ? 4-setosa, n. s. (Pl. X., figs. 76—85).

Fulva, nitida, subconvexa, capite saturatiore, abdomine albido, mandibulis apice acutis integris, intus obtuse dentatis; capite subquadrato antice parum angustiori angulis posticis rotundatis (inde subcordato) setis longis instructis; clypeo in medio supra profunde impresso genis infra in medio in tubercula duo porrecta, maxillis minutis labioque cum palpis inter tubercula affixis, maxillarum lobo apicali setoso, palpis maxillaribus 4-articulatis, articulo basali longiori, palpis labialibus

minutis biarticulatis: antennis parvis, ut videtur 8-articulatis, annulis inter 2um et 3um articulos et articulis ? in ultimo haud computatis: prothorace magno antice rotundato fere magnitudine capitis, setis paucis longis lateralibus instructis; mesothorace et metathorace perbrevibus, singulo filamentis duobus (alis rudimentalibus) instructis, latitudinem thoracis longitudine æquantibus, setosis et, ut videtur, multiarticulatis; pedibus perbrevibus incrassatis spinigeris; tarsis pedum anticorum brevissimis articulis basalibus arcte coalitis; pedum intermediorum 4-articulatis, articulis 3 basalibus brevibus at simplicibus, 4to parvo clavato; tarsis pedum posticorum difformibus, articulo basali longiori subtus in lobum producto, articulis 2 vel 3 ? minimis, ultimo elongato clavato; unguibus omnibus crassis basi dilatatis; abdomine thorace minori et angustiori segmentis apicalibus attenuatis, genitalibus exsertis, retinaculis duobus, apice 3-dentatis, lobis duobus membranaceis apice seta instructis, pene gracili curvato. Long. corp. maris circiter $1\frac{1}{2}$ mm.

Habitat in *F. asperrima*, in insula Taprobana. (DD. Thwaites et J. S. Green). In Mus. Hopeiano Oxoniæ.

I also add, by way of further illustration of the fig-insects, a figure of—

Palmon (*Pachytomus*) *Klugianus*. (Pl. X., figs. 86—88).

Westw., Trans. Ent. Soc. Lond., vol. iv., p. 260; pl. 10 fig. 23, with details.

"Ex ficubus Ægypti," a specimen of which was kindly communicated to me by the late Dr. Klug. I do not know the species of *Ficus* which it infests, and am not acquainted with the female, which has probably an elongated, exserted ovipositor.

Respecting this insect Dr. Paul Mayer observes:—"G. Mayr giebt an (Die europäischen *Torymiden*, Verh. zool.-bot. Ges. Wien., 1874, xxiv., p. 63 Anm.) die Merkmale von *Pachytomus* nach Westwood (Trans. Ent. Soc., iv., p. 260) passen auf die ♂ von *Podagrion*, Spin. und höchst wahrscheinlich seien die in Feigen gefundenen Exemplare in dieselben nur eingedrungen, um Zucker zu lecken (*op. cit.*, p. 581, note 3).

Explanation of Plates.

PLATE IV.

Fig. 1. *Sycobia bethyloides*, magnified.
2. Mandible of ditto.
3. Maxillary and labial palpi of ditto.
4. Front of clypeus and antenna of ditto.
5. Extremity of hind leg of ditto.
6. Extremity of the male genitalia of ditto, with the retinacula seen obliquely.
7. One of the retinacula of ditto, seen flat.
8. Head of a smaller male specimen of ditto, with smaller mandibles.
9. *Walkerella temeraria*, magnified.
10. Extremity of mandibles of ditto.
11. Antenna of male.
12. Extremity of the male genitalia of ditto.

PLATE V.

13. *Sycobiella Saundersii*, male, magnified.
14. Mandible of ditto.
15. Antenna of ditto.
16. Alary appendage of ditto.
17. Fore leg of ditto.
18. Tarsi of intermediate legs of ditto.
19. Extremity of the male genitalia of ditto.
20. *Sycoscapter insignis*, male, magnified.
21. Mandible of ditto.
22. Maxillæ, labium, and palpi of ditto.
23. Antenna of ditto, with several detached joints.
24. Part of the middle of one of the rudimentary wings of ditto.
25. Fore leg of ditto.
26. Hind leg of ditto.
27. Metathorax and abdomen of the male, with the terminal parts withdrawn.
28. Male genitalia of ditto, exserted.
29. Extremity of ditto, with the retinacula.

PLATE VI.

FIG. 30. Head of *Sycoscaptella affinis*, male.
31. Mandibles and maxillary palpi of ditto.
32. Antenna of ditto.
33. Fore leg of ditto.
34. Hind leg of ditto.
35. Extremity of male abdomen of ditto.
36. *Idarnella transiens*, male.
37. ,, ,, female.
38. Antenna of male *I. transiens*.
39. ,, female ,,
40. Stigmal portion of wing of female ditto.
41. Hind leg of male ditto.
42. Extremity of abdomen of male ditto.

PLATE VII.

43. *Otitesella digitata*, magnified.
44. Mandible of ditto.
45. Antenna of ditto.
46. Extremity of second and the following joint of antenna.
47. Alary appendages of mesothorax of ditto.
48. Extremity of fore leg of ditto.
49. Tibia and tarsus of intermediate leg of ditto.
50. Tibia and tarsus of hind leg of ditto.
51. Genitalia of male *O. digitata*.
52. *Otitesella religiosa*, magnified.
53. Mandibles of ditto.
54. Extremity of basal and terminal joints of antenna.
55. Alary appendage of mesothorax of ditto.
56. Tarsus of intermediate leg of ditto.
57. Genitalia of male *O. religiosa*.

PLATE VIII.

58. *Sycoscapter monilifer*, magnified.
59. Right side of the head, mandibles, and antenna of ditto.
60. Extremity of fore tibia and tarsus of ditto.
61. ,, middle tibia and tarsus of ditto.
62. ,, hind tibia and tarsus of ditto.
63. *Sycoscapter gracilipes*, magnified.
64. Front of head, mandibles, and antenna of ditto.
65. Hind tarsus of ditto.
66. One of the retinacula of male ditto.

PLATE IX.

FIG. 67. *Sycoscaptella ? anguliceps*, magnified.
68. Right side of head, mandibles, and antenna of ditto.
69. Mandibles of ditto, seen from beneath.
70. Fore tarsus of ditto.
71. Middle tarsus of ditto.
72, 73, 74. Hind tarsus of ditto, in different positions.
75. Genitalia of male ditto.

PLATE X.

76. *Sycoscaptella quadrisetosa*, magnified.
77. Front of under side of the head, showing the porrected tubercles, between which the maxillæ and labium are inserted.
78. Outer lobe of one of the maxillæ, one of the maxillary palpi, and the two labial palpi of ditto.
79. Mandibles and bilobed under side of head of ditto.
80. Antenna of ditto.
81. Extremity of prothorax, mesothorax, and base of metathorax, of one side of the thorax, showing the two rudimentary winglets.
82. Extremity of the anterior tibia of ditto.
83. Intermediate tibia and tarsus of ditto.
84. Hind leg of ditto.
85. Genitalia of male.
86. *Palmon* (*Pachytomus*) *Klugianus*, magnified.
87. Part of front margin of fore wing of ditto.
88. Fore leg of ditto.

III. Heterocerous Lepidoptera *collected in Chili by* Thomas Edmonds, Esq. By Arthur G. Butler, F.L.S., F.Z.S., &c.

[Read November 1st, 1882.]

Plate XI.

PART IV.—PYRALES and MICROS.

The collection of these groups, although less perfect than in the other tribes, consists of not less than seventy species.

In Berg's paper on Patagonian Lepidoptera an effort has been made to identify two or three of Blanchard's genera, but, apart from the imperfection of the figures and descriptions in Gay's 'Fauna Chilena,' it was improbable that the genera would be invariably correctly identified among species taken in Patagonia; and, although I labour under a similar difficulty when trying to recognise in Berg's paper identifications of Chilian species, I nevertheless have better descriptions to work with.

After a careful examination of Berg's descriptions I have been unable to recognise any of his new species as indubitably conspecific with Chilian forms; the only moths which seem to be probably identical are what I regard as *Depressaria desertorum* and a small *Gelechia*.

With respect to Blanchard's genera, recorded and in part redescribed by Berg, I have a few words to say: *Phycopterus*, Blanch., is a genus closely allied to *Spilodes*, having palpi considerably longer than the head; it has no connection whatever with *Nymphula*.* *Lindera* is identical with *Setomorpha* of Zeller = *Chrestotes*, Butler, both of which it will supersede: it appears to me that Berg has rightly identified this genus, which evidently has an unusually wide range.

With reference to some of Zeller's species, it is to be regretted that they were described from single examples,

* The figure, though not bad in outline, is very imperfect as regards markings.

but at the same time his descriptions and figures are so good as to leave little to be desired on that head: one thing alone troubles me, and that is the marvellous elasticity of his genus *Cryptolechia*, which, as it now stands, appears to combine the characters of *Depressaria*, *Hypercallia*, and not a few undescribed (though surely sufficiently distinct) genera. I am aware that the genus is divided by its author into groups, to some of which he has given distinctive names, thus introducing a trinomial system; but, with all due deference to an author who has paid considerably more attention to Micro-Lepidoptera than it has been possible for me to do, it would, I think, be decidedly preferable to raise these groups to the rank of genera: the characters given to distinguish typical *Cryptolechia* from *Machimia* do not seem to be strictly adhered to, for if 'Wicklergestalt und scharfer Vorderflügelspitze' represent the prominent characteristics of *Cryptolechia*, *C. tortricella* should be referred to *Machimia*, and *C. ochracea* and *fasciatipedella* to *Cryptolechia*; as for *C. fenestella*, I cannot see why it should be separated from *Hypercallia*, with which, in spite of its more slender and longer palpi and narrower wings, it agrees fairly well in neuration and style of coloration; in pattern and form of wing it comes nearer to Walker's *H. igniferella* than to *H. citrinalis*.

Following Professor Zeller's own definition, which corresponds with his original description in referring the species having the apex of the primaries acute to *Cryptolechia*,* I transfer *C. ochracea* and *fasciatipedella* to this genus. The apex of the wing is not only acute, but subfalcate, whereas the type of *Machimia*, according to Stainton, has "the hind margin obliquely pointed." Unhappily we do not possess an example of *M. tentoriferella*, but the *C. carnea* of Zeller, and other species referred by this author to *Machimia*, show no trace of falcation; *C. notimaculà* has, moreover, a rounded apex and palpi sufficiently characteristic to distinguish it from either genus, though bringing it nearer to *Tortricopsis*; in my opinion it would be better located under *Stenoma*, some of the species of which genus show a similar form of wing and style of coloration; the remarkable palpi, however (see Zeller's figure), which somewhat closely

* See Lord Walsingham's observations on the genus in Trans. Ent. Soc., Lond., 1881, pp. 253-4.

agree with those of Walker's Indian genus *Binsitta*, make it necessary to separate it. I shall therefore propose for this species the generic name of *Callistenoma*. (See Pl. XI., figs. 8, 8*a*).

C. renselariana of Cramer was referred by Walker, with hesitation, to his genus *Torda*; unhappily the type of the latter genus is one of those singular Deltoid-like *Tortricidæ* with a little open ear-like pouch at the base of the primaries. *T. altana*, *propriana*, and *concolorana* are species of the allied genus *Uzeda* = *Auchoteles* of Zeller; it will, therefore, be impossible to use the name *Torda* for Zeller's fifth division of *Cryptolechia*.

Mr. Edmonds' collection contains no *Galeriidæ*. With one exception (*Schistotheca canescens*, Ragonot), I know of no other species from Chili, the *Oratha significata* of Walker, placed by that author in this family, being a Geometer and identical with *Alsophila hypparia*, female, of Felder and Rogenhofer, which it will supersede.

PYRALIDÆ.

BLEPHAROCERUS, *Blanchard*.

A genus closely allied to *Zitha* of Walker.

1. *Blepharocerus rosellus*.*

Blepharocerus rosellus, Blanchard, in Gay's 'Fauna Chilena,' vii., p. 102, n. 1; pl. 7, fig. 12 (1852).

"Las Zorras, in March."—*T. E.*

ACTENIA, *Guenée*.

2. *Actenia rubescens*, n. s.

Primaries above sericeous flesh-brown, crossed in the middle by two pale-bordered parallel dusky stripes, which enclose the central area; they are nearly straight from costal margin to submedian vein, where they are abruptly elbowed; a marginal blackish line; fringe creamy yellowish, traversed by two brown lines; secondaries of male creamy yellowish, feebly and minutely grey-speckled, of the female shining greyish white; a marginal series of subconfluent black spots; fringe traversed by a dusky line, reddish brown in the

* Blanchard's figure omits the inner band across the primaries, and the abbreviated dusky arched stripe, greyish tint, subconfluent blackish marginal dots, and the line on the fringe of secondaries.

male, grey in the female; thorax flesh-coloured; abdomen of the male whitish, with reddish anal tuft, of the female greyish; primaries below more or less suffused with blackish grey; the central stripes only distinct at costa, where they are represented by whitish-bordered black dashes; secondaries shining whitish, brownish along costal and external borders; an abbreviated black stripe from the costa to the end of the cell; margin and fringe as above; body below reddish in the male, greyish in the female; tarsi white. Expanse of wings, 26 mm.

"Valparaiso, November and December."—*T. E.*

This species was placed with *Godara chilensis*.

Aporodes, *Guenée*.

3. *Aporodes efficitalis*.

Herbula? efficitalis, Walker, Cat. Lep. Het., Suppl. 4, p. 1287 (1865).

"Valparaiso, in December."—*T. E.*

Walker believed the type of this species to be from New York, and I find a label to that effect in the collection; but it is just as likely that the example was from Chili; it is allied to *A. subsequalis* of Guenée.

ENNYCHIIDÆ.

Rhodaria, *Guenée*.

4. *Rhodaria chilialis*.

Pyralis chilialis, Felder and Rogenhofer, Reise der Fregatte Novara, iv., pl. cxxxiv, fig. 30 (1875).

"Valparaiso, October and November."—*T. E.*

5. *Rhodaria purpuraria*, n. s.

Allied to *R. chilialis*; primaries above deep ferruginous, irrorated with blackish, the fringe traversed by a deep rose-coloured stripe with lilac inner and green outer edge; a narrow oblique white stripe just before the external third, and slightly inarched towards the inner margin; secondaries fuliginous; the basal half pale and somewhat ochraceous, a narrow ochreous stripe just beyond it; fringe shining pearl-grey, tipped with whitish

and traversed by an indistinct ochreous line; body greyish ochreous, the tegulæ reddish on the shoulders; primaries below sericeous blackish grey, with the costal and external borders and an imperfect discal stripe reddish clay-coloured; fringe almost covered by a broad greyish band; secondaries yellowish clay-coloured, crossed by two subparallel blackish stripes; fringe greyish, shining; body pale testaceous; legs whitish. Expanse of wings, 23 mm.

"Chillan, near the town, in March."—*T. E.*

Only one example obtained.

BOTIDIDÆ.

OROBENA, *Guenée.*

6. *Orobena mitis*, n. s.

Primaries above whitish cinereous, the costal border slightly blackish, a black-brown stripe across the basal third, inangled from the median vein; discoidal spots blackish, the reniform large, and with or without a white dash upon it; the post-median stripe pure white, widely sinuous (geschwungen), with slender black inner edging and a broad dark brown outer border; a submarginal series of black dots, followed by a dusky sinuated line; fringe whitish, traversed by a dusky stripe; secondaries shining whity-brown, almost golden; suffused with pale grey, crossed beyond the middle by an abbreviated angular blackish line, followed by a blackish streak; submarginal spots, marginal line, and fringe as in the primaries; body ash-grey; under surface greyish white, with pale gold reflections, the borders of primaries and the secondaries whiter than the remainder of the surface; blackish disco-cellular lunules; black submarginal dots; marginal line and fringe as above; a pale-bordered irregular dusky discal line; body greyish white. Expanse of wings, 26 mm.

"Valparaiso, September, October, and November."—*T. E.*

Allied to *O. sophialis*, but very distinct.

PHYCOPTERUS, *Blanchard.*

Allied to *Spilodes*, but differing in the forking of the subcostal veins of all the wings.

7. *Phycopterus flavellus.* (Pl. XI., fig. 1).

Phycopterus flavellus, Blanchard, in Gay's 'Fauna Chilena,' vii., p. 103, n. 1 (1852).

"Corral, in February; among Quilo."—*T. E.*

This species is not unlike *Spilodes turbidalis*, but the oblique apical dash on the primaries is sharply defined, and the secondaries only show a single indistinct arched greyish line.

8. *Phycopterus signariellus.* (Pl. XI., fig. 2).

Phycopterus signariellus, Blanchard, in Gay's 'Fauna Chilena,' vii., p. 103, n. 2; pl. 7, fig. 13 (1852).

"Corral, in February."—*T. E.*

This species has golden testaceous primaries, the markings upon which are more or less distinct and of a dull rose-colour, not brownish; the secondaries are cream-coloured, with a pale rose-coloured angular line beyond the middle; a marginal series of red-brown lituræ and a series of blackish dots on the fringe. I believe, notwithstanding the want of exactness in his description, that I am right in regarding this as Blanchard's species, and that it has nothing to do with M. Guenée's *Nymphula rantalis*.

Scopula, *Schranck.*

9. *Scopula amitina*, n. s.

Closely allied to *S. fulvalis* of Europe, with the same colours, but the lines across the primaries above much more slender; the secondaries whiter, and consequently with more distinct abbreviated grey discal line; primaries of the female clouded like *S. quadralis*; primaries below with the apical costal black spots larger, but the marginal spots smaller; the secondaries traversed by a well-defined arched grey discal stripe. Expanse of wings, 22 mm.

"Valparaiso, September and October."—*T. E.*

10. *Scopula cinerea*, n. s.

Possibly a variety of the preceding species, but closely resembling *S. inquinatalis* of Europe, from which it differs in the larger and blacker costal spots on the

primaries on both surfaces; the fringe of all the wings distinctly spotted with black on the under surface; the discal stripe on the under surface of primaries straight, black; the entire surface of these wings darker, the discal stripe of secondaries further down the outer margin; the discoidal cell of the same wings shorter and broader, and the palpi longer. Expanse of wings, 23 mm.

"Mountains of the hacienda of Cauquenes."—*T. E.*

11. *Scopula indistincta*, n. s.

Form and general whitish tint of *S. decrepitalis*, much smaller; primaries above pale stramineous, with the discoidal spots blackish; the upper portion of the discal line represented by a straight transverse series of black dots running from the fourth black costal spot to the second median branch; the lower portion is only represented by a few black scales between the end of the cell and the inner margin; the subbasal line is very oblique and represented by four black dots; the marginal dots are small; fringe blackish grey; secondaries with an imperfect discal grey stripe parallel to the outer margin, followed by a submarginal series of rather large grey spots and a marginal series of black dots; fringe grey at the base; body white; primaries below pale stramineous as above, the markings rather more distinct; secondaries white, with the borders slightly yellowish; the usual black markings, but the discal line slender; body below stramineous; venter with lateral series of black dots. Expanse of wings, 20 mm.

"Valparaiso, in July.—*T. E.*

S. indistincta somewhat resembles Duponchel's figure of *Ebulea fimbriatalis*.

12. *Scopula melanosticta*, n. s.

Form and pattern above of *S. prunalis*, but white, the primaries slightly tinted with stramineous, the discoidal spots black; the usual lines indistinct, the external border greyish brown, with a submarginal series of blackish spots; the usual black marginal dots; fringe blackish; secondaries with brownish external border; the usual black dots at the end of the cell and along the

outer margin; fringe white, traversed by a grey line; body above pale testaceous; primaries below greyish, the discoidal spots not so black as above; other markings much as usual; secondaries shining white, the costal and external borders slightly tinted with stramineous; black markings as usual; pectus white; legs and venter slightly tinted with brown. Expanse of wings, 22 mm.

Valparaiso ?

The single example was not numbered.

Nymphula, *Schranck.*

13. *Nymphula numeralis ?*

Pyralis numeralis, Hübner, Samml. Eur. Schmett., Pyr., pl. 14, fig. 89.

"Valparaiso, in April."—*T. E.*

Whether this is actually Hübner's insect or not I am unable to decide, as we do not possess the species: it much resembles Duponchel's figures; that of Herrich-Schäffer is entirely obliterated by the white-lead which has been laid on thickly by the artist, and has turned perfectly black. The Chilian species is certainly congeneric with *N. interpunctalis.*

Godara, *Walker.*

Allied to *Pionea*, but the males "with a reflexed tuft near the base of the costa." The Chilian species is more like *Cledeobia* than *Pionea* in colouring. Zeller's type appears to have had the tufts either rubbed off or so closely appressed to the wing as to be regarded as merely black spots; they are capable of being thrown forwards so as to appear like a black process projecting from the costal margin.

14. *Godara chilensis.*

Stemmatophora chilensis, Zeller, Verhandl. zool.-botan. Gesellsch. Wien, xxiv., p. 426 (1874).

"Valparaiso, November and December."—*T. E.*

Two males were placed with *Actenia rubescens*, which they somewhat resemble in coloration.

SCOPARIIDÆ.

STENOPTYCHA, *Zeller.*

This genus, in my opinion, should be placed near to both *Agathodes* and *Stenopteryx*, notwithstanding the more simple neuration of the decidedly narrower secondaries; the structure of the head seems to me to be decidedly opposed to its location in the *Pterophoridæ*.

15. *Stenoptycha zelleri*, n. s.

Nearest to *S. lindigi* of Felder and Rogenhofer; primaries reddish brown; the apical third darker, bounded internally by an irregularly curved "reniform" spot and a chocolate-brown spot below it; orbicular large, greyish, black-edged, but partly obliterated by a longitudinal semitransparent streak running through the radial interspaces and the discoidal cell; an ill-defined red-brown spot below the orbicular, and one or two angular blackish costal dashes nearer to the base; a slightly zigzag dusky discal line with yellow external edge; a marginal black stripe with whitish inner edge; fringe white, traversed by two black lines; secondaries pearl-white, semitransparent; disco-cellulars, a sinuous subapical streak, and a submarginal streak, greyish; a blackish marginal stripe; fringe traversed by a blackish line; body grey, spotted with red-brown; wings below pearl-white, almost silvery, markings indistinct; body below chocolate-brown; legs with white tibiæ and tarsi, barred with brown at the extremities of the joints. Expanse of wings, 28—32 mm.

"Las Zorras, December and January."—*T. E.*

The wings are thrown backwards in repose, the primaries curving, and the secondaries folding over somewhat like a fan, so that the abdominal and external margins form a continuous spiral line; they have no upward tendency: the head is almost as large as in *Stenopteryx*, owing to the prominence and size of the eyes and the somewhat large and projecting palpi; the antennæ are, however, longer than in that genus. In the secondaries the discoidal cell is long and large, more so than in *Stenopteryx*, in which respect it differs widely from the *Pterophoridæ*, in which it is decidedly small.

STENOPTERYX, *Guenée.*

16. *Stenopteryx hybridalis.*

Pyralis hybridalis, Hübner, Pyral., pl. 17, fig. 114.

"Valparaiso, all through spring, summer, and autumn." —*T. E.*

Five examples of this common and widely-distributed species were in the collection.

17. *Scopária dispersa*, n. s.

Somewhat allied to *S. valleriális*, but as small as *S. lineális* of New Zealand; primaries dark grey-brown, the veins partly black; instead of the usual inner white-bordered blackish line, the basal half is streaked irregularly with snow-white and black lines; there is also a black and white dot at the end of the cell; the discal line is snow-white and rather acutely zigzag; the costa is crossed by oblique white dashes; the outer border is white, with a marginal series of black spots; secondaries silvery; thorax dark brown; the palpi and posterior fringes of the tegulæ white; abdomen silver-grey; under surface silvery; anterior tibiæ barred with black. Expanse of wings, 19 mm.

No exact locality recorded.

ÆGERIIDÆ.

ÆGERIA, *Fabricius.*

18. *Ægeria rufa.* n. s.

Wings above deep reddish orange, with black borders; fringes grey; primaries with the borders very broad, leaving only a narrow streak of the ground colour divided by a black spot at the end of the cell; body blackish, with blue-grey gloss; abdomen with white hind margins to the segments; antennæ black; wings below with the borders slightly bronzy, those of the primaries a little narrower than above; body below leaden grey; the pectus steel-blue at the sides; legs slightly purplish above and bronzy below; middle tibiæ clothed above with orange hair. Expanse of wings, 10, 15, or 17 mm.

"Pines valley near Valparaiso; on Umbelliferous flowers in January."—*T. E.*

GALERIIDÆ.

SCHISTOTHECA, *Ragonot.*

This genus has been recently described by M. Ragonot in the Bulletin of the Entomological Society of France; the palpi are similar to those of *Donacoscaptes* of Zeller, but the structure of the wings differs considerably.*

19. *Schistotheca canescens*, Ragonot.

Primaries and thorax above sericeous-white, more or less densely irrorated with grey, sometimes so as to give them a distinct greyish tint; secondaries and body pale greyish brown, sericeous, the wings with white fringes; primaries below greyish brown, with whitish costal border and white fringe; there is a distinct reflexed costal flap, fringed at the back with fine hairs, and enclosing a woolly tuft of hair; secondaries of the typical form (the outer margin being sinuous below the apex, which is acuminate), varying from sericeous-white to greyish brown with white fringe; body below white. Expanse of wings, 44—50 mm

"*Larva.*—Pinkish white, with brown head and plate on 2nd segment. Feeds inside flower-stems of *Bromelia*.

"Valparaiso, in January."—*T. E.*

PHYCIDÆ.

MELLA, *Walker.*

20. *Mella ragonotii*, n. s.

Primaries above sericeous cream-colour, irrorated with brown and black scales; veins pale sandy brownish; two arched indistinct brown streaks towards apex, the first oblique, the second parallel to the outer margin; a black spot just before the middle of the cell, and a second, rather larger, at the inferior angle of the cell; a marginal series of minute black dots; fringe sordid at apex; secondaries silvery pale grey, with two slightly darker

* I find that Monsieur Ragonot regards this as a *Galeriid*; his types had been removed from the series and placed with others in a small box, so that it was only just discovered in time to avoid my making a synonym.

spots placed obliquely at the end of the cell; a marginal series of minute black dots; fringe white; thorax whity-brown; palpi long, acuminate, porrected, grey at the sides and white below; wings below greyish (the primaries especially), with black marginal dots and white fringe; body below white; the venter with lateral black dots; tarsi tipped with blackish. Expanse of wings, 24 mm.

Valparaiso.

CRYPTOBLABES, *Zeller*.

21. *Cryptoblabes divergens*, n. s.

Primaries above granite-grey, with a small reddish spot bounded on each side by black scales near the base of inner margin; a reddish tint on the first median interspace; a slightly irregular oblique black stripe, margined internally with white, across the basal third; a zigzag black-edged white stripe across the disc; between these two stripes is a small *I*-shaped character at the end of the cell; an ill-defined submarginal series of minute blackish dots; fringe white, traversed by two grey stripes; secondaries sericeous-white, slightly yellowish or gold-tinted at apex and base of fringe; a brownish marginal line and a slender grey line on the fringe; thorax granite-grey; abdomen pearl-grey, changing to white with blackish spots towards the anal segment; tuft creamy white; primaries below grey-brown; secondaries white, with brownish costa; body below white; legs banded with grey. Expanse of wings, 21 mm.

No exact locality recorded.

The *Phycidæ* of this collection were submitted to Monsieur Ragonot, but unfortunately the two preceding species (being discovered in the corner of one of Mr. Edmonds' boxes after the return of M. Ragonot to Paris) were not seen by him; two other species from Valparaiso which he did examine are not labelled, and therefore I conclude that he has either identified them with previously-described species,* or has not considered them to be in sufficiently good condition to make it safe to describe them.

* They appear to be *Plodia interpunctalis* and *Homæosoma nebulella*.

CRAMBIDÆ.

CRAMBUS, *Fabricius.*

22. *Crambus sabulosellus.*

Crambus sabulosellus, Walker, Cat. Lep. Het., xxviii., p. 178. n. 139 (1863).

"Chiloë, from Reed's collection."—*T. E.*

I can discover no specific character to separate this from Walker's New Zealand type; perhaps if we possessed a series of specimens from the two localities it might be possible to find distinctive characters; as it is the single Chilian example appears not to differ.

CHILO, *Zincken.*

23. *Chilo chillanicus*, n. s.

Silvery white, tinted with brassy brown; primaries above with a longitudinal subcostal brown stripe from base to apex, and immediately below it a broader snow-white stripe, bounded below by a median brown streak; apex acuminate; several minute brown marginal dots; body whity-brown, shining; primaries below pale grey, with faint golden reflections and white on the apical area; fringe white as above; secondaries snow-white, with sordid costal border; body white; legs sordid. Expanse of wings, 32 mm.

"Chillan, February and March."—*T. E.*

24. *Chilo ceres*, n. s.

♀. Nearest to *C. phragmitellus*, agreeing with the female of that species in coloration and venation, but considerably larger, with curved and slightly deflexed palpi and arched outer margin of primaries, which are less acuminate at apex; the discoidal, radial, and internal areas of these wings mottled indistinctly with grey, two parallel oblique streaks of which colour cross the disc; a distinct marginal series of small black spots; in other respects the two females are similar, the primaries and body being bright golden stramineous, with black disco-cellular dot and the secondaries shining white. Expanse of wings, 47 mm.

"Las Zorras, in December."—*T. E.*

Specimens of this species were examined, but apparently not described, by Monsieur Ragonot; he probably came to the conclusion that I have arrived at, that it was not a *Phycid*.

C. ceres may be allied to *Scricocrambus stylatus* of Wallengren from Monte Video.

MITOTHEMMA, n. g.

Allied to *Themma* = *Tunza* of Walker, but differing in the simple antennæ of the male, somewhat shorter palpi, and the emission of the 2nd and 3rd median branches of the secondaries from a footstalk.

25. *Mitothemma angulipennis*, n. s.

Primaries above pale shining gold-brown, longitudinally striated with black between the veins; one or two small black spots in the cell, one or two beyond the cell, and a marginal series; secondaries slightly sinuated between the first subcostal and third median branches, thus producing an angle at the third median branch; silvery white, slightly greyish towards apex, with a marginal series of small black spots; body whity-brown; primaries below shining greyish brown, with pale gold reflections, white towards outer margin, where there is a series of small black spots; secondaries silvery white, tinted with gold towards costa, sparsely and minutely irrorated with blackish scales; a black disco-cellular spot; an imperfect elbowed dark brown discal stripe; a marginal series of small black spots; body below shining cream-colour. Expanse of wings, 31 mm.

"Las Zorras, in May."—*T. E.*

26. *Mitothemma acuminata*, n. s.

Somewhat like a narrow-winged *Spilodes* in its general appearance; primaries above bright golden stramineous, sometimes sparsely grey-speckled, and always with two divergent oblique grey stripes running inwards from the apex, the upper one entering the discoidal cell, the lower one crossing the disc to first median branch; a more or less defined black dot at the inferior angle of the cell; a marginal series of black dots; secondaries silvery white; traces of a faint grey discal line; fringe pale sulphur-yellow; thorax stramineous; abdomen cream-colour,

irrorated with grey; primaries below cream-colour, with the discoidal area grey; a dusky apical spot; secondaries shining white, with yellowish costal border; pectus white; legs and venter cream-coloured. Expanse of wings, 32—37 mm.

"Las Zorras, February and March."—*T. E.*

27. *Mitothemma striata*, n. s.

Primaries above golden stramineous, more or less densely irrorated with grey, which sometimes forms broad longitudinal streaks in and below the cell; traces of two to three abbreviated oblique undulated parallel grey striæ from the cell to the inner margin, and beyond them two darker grey stripes from apex to inner margin, the inner one angulate-sinuous, the outer one submarginal and regularly undulated; a nearly marginal series of small black spots, followed by an extremely slender black marginal line, sometimes interrupted; secondaries shining white, irrorated with grey, crossed by a slender and sometimes black-dotted grey discal line; a slender blackish marginal line, interrupted at the extremities of the veins, and sometimes a series of blackish dots; body pale stramineous; primaries below cream-coloured, the basal three-fourths, excepting at costal border, more or less suffused with grey and bounded externally by an oblique darker line incurved towards costa; a marginal series of black dots; secondaries creamy white, shining, sparsely and minutely black-speckled; a blackish spot at the end of the cell; a discal and a marginal series of black dots; body below sordid-white. Expanse of wings, 31—35 mm.

"Las Zorras, February and March."—*T. E.*

Judging from the figure alone the *Schœnobius terreus* of Zeller from Madagascar looks as though it might belong to this genus.

Taseopteryx, n. g.

Allied to *Eromene*, but readily distinguished by its tapering clearly pectinated male antennæ; the costal margin of the primaries strongly arched towards the base, and the style of coloration which somewhat reminds one of *Plusia*.

28. *Taseopteryx sericea*, n. s. (Pl. XI., fig. 3).

Primaries above whity-brown, clouded with bronzy olivaceous; with the central area occupied by a broad oblique irregularly trigonate patch, bounded above by the costal border, and on the other sides by a black-edged white stripe; this patch is greyish white towards the costa, where the veins are blackish, the remainder being dark olivaceous varied with flesh-colour, and enclosing a cream-coloured crescent with blackish inner edge at the end of the cell and a large curved blackish-edged creamy spot within its posterior angle; two confluent black spots at the base; submedian vein ash-grey; an abbreviated oblique white stripe from apex to about the centre of the disc, where it fades into the ground colour, and followed by a longer and broader dark bronzy olivaceous stripe or band spotted with black dashes, from which longitudinal pure white stripes run to the extremity of the fringe; secondaries greyish, sericeous, with faint golden reflections; external border broadly darker, with a black marginal line interrupted at the extremities of the veins; a dusky disco-cellular lunule; fringe white, traversed by a grey stripe and tipped with grey; body pale greyish or whity-brown; primaries below dark smoky grey, the fringe spotted with snow-white; costa sprinkled with white scales; secondaries silvery white, irrorated with grey, especially on the costa; a black disco-cellular spot and marginal line; a slender undulated grey discal line; body below pale shining brown. Expanse of wings, 27—29 mm.

"Las Zorras, in November."—*T. E.*

TORTRICIDÆ.

Teras, *Treitschke.*

29. *Teras blanchardii*, n. s. (Pl. XI., fig. 6).

Somewhat the aspect of *T. proteana*, but darker; primaries pale coffee-brown, sericeous; a broad grey patch commencing in the centre of the costa, running obliquely backwards, and tapering to a mere line at basal fourth of dorsal margin, mottled with blackish, and crossed by a slightly curved blackish band, which runs obliquely outwards from the costal margin to its outer edge, bounded also just below the middle of its outer edge by

a projecting patch of pale yellowish scales; a second and much smaller patch nearer to the dorsal margin; a small projecting black spot at about the middle of the interno-median area and immediately below the first median branch; a few very indistinct reticulations on the external area, and two small blackish spots towards apex; fringe pale towards the tips; secondaries shining dark leaden grey, with faint bronze reflections; fringe shining coffee-brown, changing to whitish plumbageous towards anal angle, and traversed near the base by a dark brown line; thorax clay-coloured; head and palpi whitish; abdomen pale shining grey, anal tuft yellowish; primaries below dark shining grey, with bronze reflections; costa whitish, transversely striated with black; fringe clay-coloured, with paler edges; secondaries silvery whitish, mottled with black; the veins at apex and two abbreviated stripes upon the fringe golden cupreous; body below sordid white; legs banded with blackish. Expanse of wings, 17 mm.

Exact locality not recorded.

30. *Teras walsinghamii*, n. s. (Pl. XI., fig. 7).

Near to *T. asperana*, smaller, and with darker secondaries; primaries above with the basal half whitish ochreous, mottled with testaceous, an oblique series of four small spots, increasing in size from the costa to the origin of the first median branch, the first two very minute and black, the last two larger and formed by projecting scales of the ground colour; apical half dark purplish slate-colour, sprinkled with a few grey scales, with small black costal tufts, and a black subapical spot; secondaries shining grey, with bronze reflections; fringe whitish, brownish and traversed by a darker line near the base, and spotted with blackish at apex; thorax whitish ochreous; head and palpi blackish; abdomen grey, with whitish borders; primaries below bronze-brown, the dark area showing through the wing in certain lights, faintly speckled with whitish; costa white, striated and spotted with black; fringe ashy grey, whitish at the base, and traversed near its outer edge by a blackish line; secondaries silvery white, mottled with brown, especially towards apex; fringe whitish; body

shining leaden grey; legs whity-brown, banded with pale grey. Expanse of wings, 16 mm.

"Valparaiso, November and December."—*T. E.*

31. *Teras fernaldii*, n. s.

Allied to *T. abietana*, though in some respects more like *T. variegana*; much darker, the secondaries especially darker; primaries above whity-brown, very faintly tinted with pink in certain lights, mottled irregularly all over with dark red-brown and black, the most conspicuous markings being two connected black-edged red-brown oblique bands forming a very irregular and almost *H*-shaped character across the centre of the wing; upon the inner arm of this character is a pale sulphur-yellow annulus, from which a small tuft of scales of the same colour projects; immediately beyond the *H*-shaped character is a very irregular oblique purplish-grey forked band spotted with black; fringe pale brown, traversed by two darker lines; secondaries dark grey, with bronze and purplish reflections; basi-abdominal area pale; fringe whity-brown, spotted at apex with blackish, and traversed by two dark lines; body shining grey; head and palpi sordid whitish; wings below shining whitish, reticulated with grey, the costal margins spotted with black; primaries with the apical three-sevenths blackish; fringe tipped with red-brown; secondaries with three conspicuous blackish costal spots, a fourth on the fringe at apex, and two smaller spots on the outer margin; fringe as above; body below sordid whitish; legs banded with pale brown; venter with lateral series of black spots. Expanse of wings, 17 mm.

"Valdivia, in February."—*T. E.*

Arctopoda, n. g.

Nearest to *Cacoecia*, which it nearly approaches in neuration; body extending beyond the secondaries, rather slender, with scarcely perceptible anal tuft; antennæ rather long, tapering, ciliated; palpi short, broad, and hairy; legs short, thick, the tibiæ clothed with rather long hair, the spurs moderately long; anterior legs clothed with hair almost to the extremity of the tarsi; primaries broad, the costal margin nearly straight, and not much longer than the inner margin; outer margin slightly convex from the middle to the external angle; secondaries subovate, with nearly straight costal margin, slightly concave towards apex.

32. *Arctopoda maculosa*, n. s. (Pl. XI., fig. 5, ♀).

♂. Primaries above reddish chocolate; disco-cellular veins black, all the other veins regularly spotted with black; secondaries black-brown, with an apical patch, and the apical half of the fringe bright orange; remainder of fringe dark grey; thorax dark purplish brown; abdomen blackish; wings below brilliant golden orange; primaries crossed beyond the middle by a broad oblique black belt, expanding towards the outer margin; fringe broadly tipped with purplish, spotted with black; anal half of fringe of secondaries blackish; body below dark grey; legs whitish, clothed with dark grey hair; venter with whitish segmental bands. Expanse of wings, 30 mm.

♀. Larger than the male; primaries clouded with orange in the middle, and with a broad apical patch of the same colour, upon which the black spots are very conspicuous; secondaries with a sprinkling of orange scales within and below the cell, and the apical patch extending as a tapering border round the outer margin; primaries below with the black belt reduced to a rather narrow band; secondaries with the basal area dulled and bounded externally by a somewhat diffused angular dusky band indicating the dark area of the upper surface; body below bronze-brown; legs partly whitish. Expanse of wings, 34 mm.

"Las Zorras, in December."—*T. E.*

This handsome species reminds one vaguely of *Cacoecia podana*, although altogether more brilliantly coloured; in the form and opaque coloration of the wings it agrees better with *Ptycholoma*.

ŒNECTRA, *Guenée.*

33. *Œnectra approximata*, n. s.

Primaries above golden testaceous, reticulated with grey, and crossed by double-arched series of small black spots; an oblique dark-edged greyish stripe running from the costa before the middle to below the first median branch, and almost joined before its extremity by a reversed stripe of the same character running obliquely upwards from a parallel point on the inner margin; fringe brown externally; secondaries sericeous-

white, reticulated with grey; thorax ochraceous; abdomen silvery grey, with ochraceous anal tuft; primaries below pale golden, with the markings less defined than above; secondaries as above; body pale ochraceous. Expanse of wings, 24 mm.

"Valparaiso, in January. The larva feeds within the stems of its food-plant."—*T. E.*

34. *Œnectra fulvaria?* (Pl. XI., fig. 4).

Tortrix fulvaria, Blanchard, in Gay's 'Fauna Chilena,' vii., p. 99, n. 1 (1852).

"Valparaiso, in January."—*T. E.*

Standing in the collection with the preceding species, from which, however, it differs in its occasionally greater size, its longer palpi, deeper coloration, and in the pattern of the primaries; these wings are of a sericeous tawny testaceous colour, reticulated throughout with grey, a line of which colour crosses the wings obliquely near the base; there is a diffused dusky spot at the end of the cell, and a greyish subapical costal cuneiform patch; the secondaries are cream-coloured, reticulated with grey, and tinted with testaceous towards apex. Blanchard's specimens appear to have been small, if they really belonged to the species before me (as the coloration leads me to believe that they did).

Var. *dives*.

Size and coloration of primaries recalling *Pœdisca grandiflavana*, Wlsm.; these wings are sericeous golden stramineous, indistinctly reticulated with grey, some of the lines with a few blackish scales upon them; base of costal margin grey, spotted with blackish; a dark grey spot sometimes quadrate and in outline just beyond the middle of the costa, from which an indistinct brownish discoloration crosses the wing to the dorsal margin; a dark grey or pale brownish spot at the end of the cell; a more or less distinct subapical costal grey-edged patch; base of fringe grey; secondaries silvery white, more or less sordid and reticulated with grey; body pale stramineous; under surface pale shining stramineous; the secondaries paler than the primaries, which are more or less clouded with grey in the centre; all the wings reticulated with grey; anterior and middle legs banded with grey. Expanse of wings, 32—33 mm.

Sciaphila, *Treitschke.*

35. *Sciaphila leonina*, n. s.

Allied to *S. gouana*, but larger, and with the coloration of *Affa bipunctella* of N. America; primaries above golden stramineous, shining; sprinkled sparsely, and particularly upon the veins, with black scales; a black dot at the inferior angle of the cell; secondaries sericeous-grey, darker and cupreous towards apex in the male; fringe white, traversed near the base by a more or less defined grey line; head and thorax stramineous, abdomen pearly white; primaries of male below blackish, with cream-coloured borders; of female creamy, slightly greyish in the middle; costa slightly testaceous; secondaries shining white; costal area slightly stramineous; body below pearly whitish; legs greyish. Expanse of wings—male 30 mm., female 33 mm.

"Valparaiso, in November."—*T. E.*

Dichelia, *Guenée.*

36. *Dichelia exusta*, n. s.

Aspect of *D. rubicundana*, but much larger; primaries above dark laky red-brown, varying to deep reddish gravel-colour, with golden or pink gloss; striated and spotted with black, and crossed by four equidistant ill-defined oblique darker bands, the first and last very indistinct; secondaries sericeous-white, more or less mottled with dark grey; head and thorax purplish brown; abdomen silvery white, with slightly yellowish anal tuft; primaries below dark grey-brown, the costa and external area washed with reddish cupreous or pale golden, and reticulated with blackish; secondaries sericeous-white, more or less mottled with blackish; body below golden or silvery whitish. Expanse of wings, 23—24 mm.

Valparaiso.

This species bears a strong resemblance to Zeller's figure of his *Sciaphila radicana*; the base of primaries is sometimes slaty grey.

Tortrix, *Linnæus.*

37. *Tortrix chrysopteris*, n. s.

General aspect of a large *T. icterana*; primaries shining golden stramineous, with faint indications of a few reddish reticulations; a large triangular slightly

whiter patch, edged and reticulated with red-brown below the middle of the dorsal margin; secondaries pale cupreous-brown, greyish towards the abdominal margin, and with whitish fringe; body golden stramineous; primaries below redder than above, and indistinctly reticulated with reddish throughout; secondaries cream-colour, indistinctly reticulated with golden orange towards costa, and with greyish towards the abdominal margin; body pale stramineous; legs reddish. Expanse of wings, 28 mm.

No exact locality recorded; probably Valparaiso.

Melaneulia, n. g.

Nearest to *Eulia* (*E. ministrana*) in form and general structure, but the antennæ distinctly ciliated on both sides throughout, the abdomen more slender; primaries with the costa distinctly more convex towards the base; the apex slightly more produced, thus rendering the outer margin more oblique; secondaries with the outer margin straight below apex, but not at all concave; disco-cellulars regularly oblique.

38. *Melaneulia hecate*, n. s.

Smoky black; primaries above changing in certain lights to purplish; a reddish cupreous curved marking at the end of the cell; a few scales of the same colour on the lower half of the dorsal margin, and a few more on the fringe towards apex; head reddish; under surface smoky black, without markings; body below dull whitish. Expanse of wings, 17 mm.

"Valdivia, in February."—*T. E.*

This singular little species unfortunately is only represented by one example, which has suffered somewhat in its capture, the thorax and base of primaries being a good deal rubbed and the palpi destroyed; enough, however, remains to characterise it.

Phtheochroa, *Stephens*.

The single species in the collection has more than usually small palpi, formed as in *P. rugosana*, but rather rubbed in the type specimen; the style of coloration is more like that of *Pygolopha*.

39. *Phtheochroa inexacta*, n. s.

Primaries above white, mottled with grey; a large black-dotted grey *U*-shaped spot (filled in) at the basal fourth of costa, and a broad irregularly angulated grey band striated with darker lines and dotted with black and reddish just before the middle; this is followed by a band of the ground colour, white speckled with red-brown, and marked in the middle with two oblique divergent black dashes; a large dark grey-brown crescent-shaped patch, spotted with black at its upper extremity, fills in the external angle, and almost confluent with this is an oblique black-flecked subapical band of the same colour; a squamose black marginal line; fringe spotted with brown; secondaries sericeous whity-brown, with faintly indicated darker reticulations and marginal line; thorax whitish, black-spotted; abdomen sericeous whity-brown; primaries below shining greyish brown, costa mottled with white; a blackish marginal line and two on the fringe; secondaries white, flecked with dark brown; pectus silvery white; venter and legs dull white. Expanse of wings, 16 mm.

"Mountains of the hacienda of Cauquenes."—*T. E.*

Sericoris, *Treitschke.*

40. *Sericoris wilkinsonii*, n. s.

Form of *S. umbrosana*; primaries above with the basi-dorsal half sericeous grey-brown, crossed by partly black-edged darker bands; the upper oblique edge of this area is deeply bisinuated; externo-costal half white, slightly sericeous, almost obliterated on the external area by transverse ash-grey stripes flecked with black and cupreous-brown; costal margin and fringe spotted with dark grey; secondaries silvery grey; fringe white, traversed near the base by a slender grey line; thorax white, black-spotted; abdomen silvery grey; primaries below dark grey; costa mottled with white; secondaries silvery white, dotted or spotted with dark grey; body below silvery whitish. Expanse of wings, 18 mm.

"Valparaiso, November and December."—*T. E.*

The three following species, notwithstanding their longer palpi, manifestly belong to the same genus;—

41. *Sericoris cauquenensis*, n. s.

Allied to *S. urticana*; primaries silvery greyish white, indistinctly striated with grey; base greyish, bounded externally by an irregular oblique abbreviated dark brown band, blackish and white-edged along its outer border; a second similar but bronze-brown white-margined band just before the apical third; a subapical triangular bronze-brown costal spot, and a partly black-edged cuneiform spot or streak of the same colour along the centre of the outer margin; fringe pinky brown, traversed by two blackish lines; secondaries silvery whitish, striated with pale grey, a grey marginal line and two blackish lines on the fringe; body above grey; primaries below dark shining grey; costal border spotted with blackish and white; a slender white line at the base of the fringe; secondaries sericeous-white, striated with grey-brown; apical area and fringe pale golden brown, the latter with blackish lines as above; body below pearly white. Expanse of wings, 18 mm.

"Mountains of the hacienda of Cauquenes."—*T. E.*

42. *Sericoris erebina*, n. s.

Certainly allied to the preceding species; but the primaries sericeous dove-grey, crossed by about nine equidistant undulated golden lines, only visible with a lens; secondaries shining greyish brown, with indistinct slightly darker striations; fringe silvery greyish, with a basal white line; body above grey; primaries below sericeous greyish brown; edge of costal margin white dotted with brown; fringe with a basal white line; secondaries shining white, striated with grey; costa and apical area slightly brownish; body below pearly white. Expanse of wings, 19 mm.

"Mountains of the hacienda of Cauquenes."—*T. E.*

43. *Sericoris eurydice*, n. s.

Aspect of *S. urticana*; primaries above pale sericeous greyish brown, mottled with flesh-colour; finely striated with grey lines, dotted here and there with black; basal fourth dark brown, with angular black outer edge; a slightly irregular black-edged dark brown oblique band just beyond the middle, and a subapical costal dark brown spot; an indistinct marginal series of grey spots;

fringe shining stramineous, traversed by a grey line; secondaries whity-brown, rather densely mottled with grey; fringe traversed near the base by a broad stripe of dark grey; body greyish brown; primaries below sericeous grey-brown, with faint indications of the darker markings of the upper surface; costa whitish, spotted with black; fringe shining stramineous, traversed by a well-defined grey stripe; secondaries slightly whiter than above; body below sericeous-whitish. Expanse of wings, 16 mm.

Probably Valparaiso.

CHOREUTIDÆ.

CHOREUTIS, *Hübner.*

44. *Choreutis bjerkandrella.*

Tinea bjerkandrella, Thunberg, Diss. Ent. (Ins. Suec.) i., p. 24 (1784).

"Valparaiso, in December."—*T. E.*

The three specimens before me all differ in size and in coloration; the two larger ones scarcely showing the white stripe usually found on the secondaries, the larger of these two also wanting all the orange markings on the primaries, in which respect it agrees with an example in the Museum from Espirito Sancto; the smallest of the three agrees in all respects with the dwarfed form named by Duponchel *C. pretiosana*, which, according to Staudinger and Wocke, is identical with Zeller's *C. australis.*

ATYCHIIDÆ.

ATYCHIA, *Latreille.*

45. *Atychia triphænoides*, n. s.

Primaries above blackish piceous; fringe shining yellow-golden, blackish at base; secondaries golden orange, sericeous, borders blackish piceous; fringe shining yellow-golden, blackish at base; body blackish; thorax clothed with grey hairs; abdomen wanting; primaries below with a median streak from the base, turning upwards across the extremity of the cell, yellow-golden; remainder of the wing purplish piceous, the outer half of the fringe paler and more brassy than above; secondaries slightly paler than above, otherwise

similar; pectus and legs dark purplish piceous. Expanse of wings, 23 mm.

"From Reed's collection."—*T. E.*

I believe this to be the most beautiful species hitherto described.

TINEIDÆ.

NEMOPHORA, *Hübner.*

46. *Nemophora fasciolata*, n. s.

Creamy white, shining, with faint golden reflections; primaries sordid at base and along the apical and external margins; an abbreviated subangulated oblique brown band at basal sixth, and a second straight band from the median vein to just beyond the middle of the dorsal margin; a small dark brown spot at the inferior angle of the cell; body whity-brown; legs pearl-white; wings below bronzy brownish, with opaline reflections; fringe white; body below white. Expanse of wings, 22 mm.

"Valdivia, Reed's collection."—*T. E.*

Most nearly allied to *N. swammerdamella.*

HYPONOMEUTIDÆ.

TŒCORHYCHIA, n. g.

Form of wings much as in *Tinea* (*T. arcuatella*); primaries with slightly arched costa; apex acute; outer margin very oblique; fringe long; dorsal margin nearly straight, slightly convex at the base; secondaries elliptical, with nearly straight costal margin; apex rather acute; fringe long, especially at anal angle; cells of all the wings long; head about half the width of thorax, with smooth convex crest; palpi moderately long, extending for two-fifths of their length in front of the head, acuminate, slightly ascending, straight, tapering; the second joint coarsely scaled, but not fringed, about twice the length of the third; antennæ long, tapering, with well-developed coarse appressed silky pectinations in front to the commencement of their terminal fourth, where they taper off, and are replaced by imperfect serrations; body tolerably long, extending for nearly half its length beyond the secondaries; thorax short, rounded; abdomen slender, keeled, with small contracted anal tuft; legs rather long and slender; the hind tibiæ clothed with long hair.

47. *Tœcorhychia cinerea*, n. s.

Shining ash-gray; primaries with the costa black-spotted beyond the middle; an oblique black spot at the end of the cell and an oblique series of minute black dashes beyond it across the disc; a slender blackish marginal line; fringe cream-coloured; secondaries paler, especially towards the abdominal margin; a marginal series of dusky dots; fringe cream-coloured; wings below shining grey, with cream-coloured fringes; pectus and front legs grey; middle legs greyish white; venter and posterior legs cream-coloured. Expanse of wings, 22 mm.

"Valparaiso, in houses."—*T. E.*

PLUTELLIDÆ.

PLUTELLA, *Schranck.*

48. *Plutella xylostella.*

Tinea xylostella, Linnæus, Syst. Nat., x., p. 538.

"Mountains of the hacienda of Cauquenes."—*T. E.*

GELECHIIDÆ.

ORTHOTELIA, *Stephens.*

49. *Orthotelia increta*, n. s.

Decidedly larger than *O. sparganiella*, and with longer and more acuminate palpi; primaries above coffee-brown, shining, with a feeble lilac gloss; costal margin dull red; external border dusky; fringe traversed by two black stripes and tipped with pink, which gives place to snow-white at external angle; discoidal spots indicated in dark brown; a slightly curved transverse discal series of white-dotted dark brown dashes; secondaries shining grey; costa and fringe whitish, the latter traversed by two indistinct grey stripes; a yellowish line along the outer margin; head and thorax red-brown; abdomen greyish; under surface shining whitish, irrorated with dark grey; primaries with the costal margin and external area testaceous, and a broad elbowed band immediately within these (passing through the cell and across the disc) blackish; secondaries with pale testaceous costal area and external margin; anterior and middle pairs of legs brownish. Expanse of wings, 30 mm.

"Corral, Valdivia, in February."—*T. E.*

DEPRESSARIA, *Haworth*.

50. *Depressaria edmondsii*, n. s.

Wings above shining grey, darker towards the external area; primaries tinted with pink, the base black-brown, with purplish reflections; a very irregular transverse brown band just before the middle; costal border, from the commencement of this band to apex, spotted with blackish; an arched dusky submarginal band; a marginal series of black dots; fringe traversed by two dusky lines; secondaries somewhat silvery, with a slender blackish marginal line; fringe traversed near its base by a grey line; head and thorax purplish brown; abdomen grey; primaries below leaden grey; a costal black-spotted cream-coloured stripe curving round at apex and fading into a whitish marginal border; fringe rather more silvery than the body of the wing; secondaries shining white, with the costal area grey-speckled; a blackish interrupted marginal line; body below shining whity-brown; anterior and middle legs banded above with dark brown. Expanse of wings, 19 mm.

"Mountains of the hacienda of Cauquenes."—*T. E.*

HELIOSTIBES, *Zeller*.

51. *Heliostibes mathewi*.

Heliostibes mathewi, Zeller, Verhandl. zool.-botan. Gesellsch. Wien., xxiv., p. 435, n. 1, pl. xii., fig. 4 (1874).

Valparaiso.

Only one example was obtained by Mr. Edmonds.

GELECHIA, *Zeller*.

52. *Gelechia invenustella?*

Gelechia invenustella, Berg, Bull. Soc. Imp. Nat. Mosc., 1875, p. 240.

"Mountains of the hacienda of Cauquenes."—*T. E.*

The single specimen which I think may possibly be referable to this species is worn and somewhat broken; it is allied to *G. humeralis* of Europe.

53. *Gelechia aterrimella ?*

Gelechia aterrimella, Walker, Cat. Lep. Het., xxix., p. 590, n. 225 (1864).

"Mountains of the hacienda of Cauquenes."—*T. E.*

Only one example having been obtained, which was unavoidably ruined in the attempt to relax and set it, I am unable to be certain of its identification.

54. *Gelechia ocelligera*, n. s.

Allied to *G. infernalis* of Europe; primaries dark chocolate-brown; external border greyish white, with a submarginal grey band extending from the inner margin to near the apex, where there is a rounded black spot; fringe whitish, with a dark grey basal stripe; secondaries shining leaden grey; fringe creamy white, traversed by two greyish undulated stripes; thorax sericeous chocolate-brown; abdomen leaden grey; primaries below shining bronze-brown, the veins beyond the middle and the costa towards apex streaked with white; fringe cream-coloured, traversed by a grey band, which is followed by a dark brown line; secondaries silvery white, tinted with bronze at apex, where there is also an abbreviated blackish line upon the fringe; body below pale bronze-brown, coxæ opaline. Expanse of wings, 16 mm.

"Mountains of the hacienda of Cauquenes."—*T. E.*

Topeutis, *Hübner.*

55. *Topeutis venosa*, n. s.

Form of *Pleurota bicostella*, but with the structure of *Topeutis*; primaries above dark grey, the veins white; fringe greyish white, traversed towards apex by pure white lines; secondaries silvery white, fringe cream-coloured; head and thorax greyish white; abdomen sericeous creamy white; primaries below and pectus grey; secondaries as above; venter silvery white. Expanse of wings, 29 mm.

"Valparaiso."—*T. E.*

HYPERCALLIA, *Stephens*.

56. *Hypercallia fenestella*.

Cryptolechia fenestella, Zeller, Verhandl. zool.-botan. Gesellsch. Wien, xxiv., p. 439, n. 4; pl. xii., fig. 9 (1874).

Machimia fenestella, Zeller, Horæ Soc. Ent. Ross., xiii., p. 259, n. 11 (1877).

Valparaiso.

Only one example (without abdomen) stands in Mr. Edmonds' collection.

ŒCOPHORA, *Zeller*.

This genus contains several distinct groups which ought to be separated generically; the Chilian species now to be described agrees most nearly in structure with *Œ. sulphurella*.

57. *Œcophora minnetta*, n. s.

Sericeous silvery white; primaries with a few widely-scattered black scales; base of costal border black; an irregular black costal patch, as in *Cryptolechia roseo-costella*, Wlsm. (Trans. Ent. Soc. Lond., 1881, pl. xii., fig. 26), a dusky subapical costal spot; fringe of all the wings and of the posterior tibiæ cream-coloured; primaries below sericeous greyish-brown; secondaries shining white, with brown costa; palpi with the basal two-thirds of the second joint and the tip of the third joint black externally; body and front legs below sericeous-brown; posterior legs pearly white, the tarsi banded above with black. Expanse of wings, 17 mm.

"Mountains of the hacienda of Cauquenes."—*T. E.*

HYPERSKELES, n. g.

Allied to *Œcophora*, aspect of *Dasycera*; secondaries broader than in either genus; the primaries rounded at apex, but with the external angle well defined and consequently with short fringe; antennæ filiform; palpi slender, porrect, long and widely separated; legs long and thick, but not fringed.

58. *Hyperskeles choreutidea*, n. s.

♀. Black-brown; primaries with a nearly central abbreviated white costal dash, tapering to a point as it reaches the median vein, and tinted with gold upon the costal margin; a spot of golden ochreous within the cell on each side of the white dash; a subapical silvery white lunule, followed by a golden ochreous apical border, the commencement of which upon the costa is indicated by a paler golden spot; two patches of greyish scales on the disc; fringe tipped with whitish; secondaries crossed at basal third by an oblique sordid white band; an abbreviated white central band from the costa to the median vein; a diffused patch of greyish scales on the disc; fringe tipped with whitish grey, white at apex; abdomen crossed by slender greyish lines; anal segment pearl-white; wings below as above, but the markings more developed; primaries with a broad ochreous subcostal band from the base to the first discoidal spot, with which it unites; a distinct white spot on the disc beyond the end of the cell; internal border ash-grey; secondaries with a broad ochreous costal band and a transverse dash of the same colour between the two white bands; a white subapical spot; body below pearly white, the legs pale brownish grey above; tarsi with white annulations. Expanse of wings, 14 mm.

"Valdivia, from Reed's collection."—*T. E.*

Callistenoma, n. g.

Allied to *Stenoma*, but at once distinguished by its palpi, the second joint being broad, compressed, and fringed below (not above, as in the undoubtedly allied genus *Anchinia*). See Pl. XI., fig. 8*a*.

59. *Callistenoma ustimacula.*

Cryptolechia ustimacula, Zeller, Verhandl. zool.-botan. Gesellsch. Wien, xxiv., p. 440, n. 5; pl. xii., fig. 10 (1874).

Machimia ustimacula, Zeller, Horæ Soc. Ent. Ross., xiii., p. 259, n. 23 (1877).

"Valparaiso, in November."—*T. E.*

Var. *zelleri*. (Pl. XI., fig. 8).

Differs from the typical form in having a rounded grey spot upon the disc of the primaries below the cuneiform costal patch, to which it is united by a pale yellowish nebula; also an arched externo-discal series of dark grey spots, the uppermost of the series partly yellow and joining the inferior angle of the cuneiform patch; secondaries shining bronze-brown instead of white. Expanse of wings, 26 mm.

"Valparaiso, in November."—*T. E.*

MACHIMIA, *Clemens*.

60. *Machimia desertorum?*

Depressaria desertorum, Berg, Bull. Soc. Imp. Nat. Mosc., 1875, p. 239, n. 52.

"Mountains of the hacienda of Cauquenes."—*T. E.*

Whether this is or is not the true *D. desertorum* I have no means of deciding; it somewhat resembles the *Depressaria costosa* of Europe.

CRYPTOLECHIA, *Zeller*.

61. *Cryptolechia fasciatipedella*.

Cryptolechia fasciatipedella, Zeller, Verhandl. zool.-botan. Gesellsch. Wien, xxiv., p. 437, n. 2; pl. xii., fig. 7 (1874).

Machimia fasciatipedella, Zeller, Horæ Soc. Ent. Ross., xiii., p. 259, n. 9 (1877).

"Valparaiso, in December."—*T. E.*

This species varies considerably in depth of colour, the primaries being in some examples reddish ochreous, and in others rust-red, sprinkled with grey scales.

62. *Cryptolechia ochracea*.

Cryptolechia ochracea, Zeller, Verhandl. zool.-botan. Gesellsch. Wien, xxiv., p. 436, n. 1; pl. xii., fig. 6 (1874).

Machimia ochracea, Zeller, Horæ Soc. Ent. Ross., xiii., p. 259, n. 8 (1877).

"Valparaiso, in December."—*T. E.*

Very near to the preceding species, but the primaries chrome-yellow, with dark fringe and a more or less defined angular series of brown discal dots; discoidal spots the same; interno-basal area broadly irrorated with red; secondaries white or flesh-coloured.

63. *Cryptolechia luridella.*

Cryptolechia luridella, Zeller, Verhandl. zool.-botan. Gesellsch. Wien, xxiv., p. 438, n. 3; pl. xii., fig. 8 (1874).

Machimia luridella, Zeller, Horæ Soc. Ent. Ross., xiii., p. 259, n. 19 (1877).

Valparaiso.

Only one example of this species was obtained.

64. *Cryptolechia phœnissa*, n. s. (Pl. XI., figs. 12, 12*a*).

Wings sericeous carmine-red; primaries above with a small triangular golden spot at outer third of dorsal margin; fringe at apex tipped with bright ochreous; thorax purplish brown; antennæ carmine; palpi whitish; abdomen dark brown; wings below of a clearer carmine-red than above; base of secondaries and pectus bronze-brown; legs and venter whity-brown. Expanse of wings, 16 mm.

"Corral, in February."—*T. E.*

Pachyphœnix, n. g.

Allied to *Tortricopsis*, but with broader wings and more slender body; primaries with the second subcostal forked instead of the fourth; cell of secondaries broader, the veins arranged in the same way, but the fold within the cell forked beyond the middle; head narrower than in *Tortricopsis*; the palpi with less prominent fringe to the second joint, not more than half the width of that in *T. rosabella.*

65. *Pachyphœnix sanguinea*, n. s. (Pl. XI., figs. 13, 13*a*).

Primaries above sericeous laky brown, slightly lilacine towards outer margin; an oblique greyish stripe from the apex to the end of the cell; secondaries sericeous carmine-red; body above dark brown; wings below carmine-

red; pectus brownish white; anterior legs dark brown, middle legs purplish; hind legs pale golden yellowish, banded with rose-red; venter golden yellow. Expanse of wings, 24 mm.

"Corral, in March."—*T. E.*

PALÆPHATUS, n. g.

Almost exactly the form of "*Machimia uncinella*" of Zeller, but the primaries slightly more falcate, with the external angle a little more prominent; secondaries with the discoidal cell long and narrow; the costal and subcostal veins widely separated to admit a large basal oblong glandular swelling upon the under surface and a corresponding pencil of hairs (somewhat as in *Trichostibas*, Zeller) on the upper surface; the subcostal branches and the radial vein are thus crowded together, and the wing is longitudinally folded immediately below the subcostal; the median vein emits its first branch before the middle, and therefore at a considerable distance from the second; the second and third are quite distinct; the body is comparatively short for the group, barely exceeding the secondaries; the head broad, coarsely scaled, the antennæ thick, rather short, tapering, cylindrical, but slightly flattened in front, which causes them to curl inwards when dry; palpi thick, moderately long, widely separated; the second joint slightly deflexed, about as long as the head; third joint rather more than half the length of the second, slightly ascending.

66. *Palæphatus falsus*, n. s. (Pl. XI., fig. 11).

Aspect and style of coloration of *Cerostoma*, though wholly different in structure; primaries above shining golden stramineous, transversely striated with little brown dashes; costa spotted with brown, and beyond the middle with white; fringe traversed by an imperfect brown stripe, and spotted externally with white; an abbreviated oblique brown stripe before the middle of the wing, and a reversed oblique brown dash towards apex; secondaries shining leaden grey, paler towards the base; fringe broadly tipped with white; body cream-coloured; primaries below golden brown; secondaries bronzy grey, borders and fringes as above; body below cream-

coloured; palpi and venter dotted with blackish scales. Expanse of wings, 24 mm.

"From Reed's collection."—*T. E.*

Without the lens this insect bears a remarkable resemblance to *Cerostoma*; the outline of the wings, including the fringes, being the same; but whereas this form is produced by the fringe in *Cerostoma*, in the present genus it is the result of a sinuous outer margin.

PISINIDEA, n. g.

Form of *Cryptolechia*, excepting that the apex of the primaries is a little more produced, and the outer margin consequently more oblique; all the veins of the primaries separate, not forking, but the fifth subcostal branch and the upper radial closely approximated; neuration of secondaries very similar to that of *Tortricopsis*; body moderately long and stout; head tufted in the middle in front; antennæ a little more compressed than in the preceding genus; palpi long, porrect, divergent, widely separated, not curving upwards at the extremity, extending for a considerable distance in front of the head; the second joint thickened with coarse scales above nearly as in *Anchinia*, but the third joint comparatively longer than in that genus; legs rather long and slender.

67. *Pisinidea viridis*, n. s. (Pl. XI., fig. 10).

Primaries above pea-green; with a rounded ferruginous spot at the end of the cell; secondaries sericeous whity-brown; body whity-brown; under surface rusty reddish; primaries with the borders towards apex yellowish. Expanse of wings, 27 mm.

"Chiloë ?, from Reed's collection."—*T. E.*

AGRIOCOMA, *Zeller.*

68. *Agriocoma mimulina*, n. s. (Pl. XI., fig. 9).

Apparently somewhat similar to Zeller's *Conchylis delicatulana*; primaries above bright sulphur-yellow; a stripe along the base of the costal nervure reddish, spotted with blackish, and joining at basal third the commencement of a broad triangular reddish patch with blackish edges, which extends nearly to apex, and is spotted on

costal margin and at its inferior angle with white; an externo-discal series of minute blackish dots, sometimes obsolete; secondaries sericeous snow-white; thorax above reddish, abdomen white; wings below snow-white; primaries with the basi-subcostal stripe and triangular patch indicated in leaden grey; palpi and under surface of anterior legs reddish. Expanse of wings, 17—19 mm.

"Valparaiso, November and December."—*T. E.*

A variety occurs in which the reddish markings above are strongly suffused with slaty grey.

Lindera, *Blanchard.*

69. *Lindera tessellatella.*

Lindera tessellatella, Blanchard, in Gay's 'Fauna Chilena,' vii., p. 106, n. 1 (1852); Berg, Bull. Soc. Imp. Nat. Mosc., xlix., p. 236, n. 18 (1875).
Safra bogotatella, Walker, Cat. Lep. Het., xxix., p. 785, n. 1 (1864).
Setomorpha bogotatella, Zeller, Horæ Soc. Ent. Ross., xiii., p. 205, n. 1 (1877).
Chrestotes bogotatella, Butler, Ann. & Mag. Nat. Hist., ser. 5, vol. 7, p. 401 (1881).

No exact locality recorded.

Ithutomus, n. g.

Form and style of marking of *Psecadia*; wings long and rather narrow; primaries with the costal margin slightly convex, the outer margin oblique, but rather less so than in *Psecadia*, inner margin nearly straight; discoidal cell long, extending almost to the second third of the wing; all the veins separate at their origins; costal vein extending to about the middle of the margin; subcostal four-branched; the last subcostal, three radials, and the third median branch emitted, at about equal distances, from the end of the cell; the second median close to the third; secondaries elongate-ovate; costal and subcostal veins nearly parallel, the latter simple, not forked; radial forked, emitted from a short footstalk; disco-cellulars very oblique; second and third median branches emitted close together and widely separated from the first branch; abdominal margin very convex;

body robust; head crested; antennæ thick at the base (broken off short in the type); palpi rather thick, acuminate, extending some distance in front of the head, curving upwards, well separated, the second and third joints of nearly equal length; legs rather thick and long, the spurs of the posterior tibiæ long and thick.

70. *Ithutomus formosus*, n. s.

Somewhat resembles Zeller's *Pædisca chloroticana*; primaries above emerald-green, with a longitudinal irregular black streak commencing at the base of the costa, whence it runs obliquely to just below the submedian vein, thence emitting a narrow streak along the median vein to about its middle, where it again expands and throws off a transverse spur to the dorsal margin and terminates in a furca, partly enclosing a red-brown spot, close to the end of the cell; costa and dorsal margin black-spotted; outer half of costal margin cream-coloured; a large black apical patch, united to a cupreous-brown patch near the external angle, the two together forming an imperfect external border; secondaries whity-brown, slightly more golden towards apex; fringe white; head and thorax green, spotted with black; abdomen pale brown; primaries below flesh-tinted, slightly green on the basal two-thirds, and with the discoidal area blackish; a few scattered minute grey spots; fringe spotted with blackish; secondaries flesh-tinted, greyish towards the costal and cream-tinted towards the abdominal border; body pale brown; palpi green, black at base; anterior and middle legs blackish, the tibiæ with a green band; tarsi white, banded with blackish; hind legs pale brown. Expanse of wings, 29 mm.

"Valdivia, from Reed's collection."—*T. E.*

Seems most nearly allied to Walker's genus *Tamarrha*, but differs in neuration and in its style of coloration.

ARGYRESTHIIDÆ.

ARGYRESTHIA, *Hübner.*

71. *Argyresthia conspersa*, n. s.

Primaries above shining golden; a tapering costal stripe, a similar dorsal stripe, and three oblique subparallel stripes across the external half, shining snow-white, dotted here and there with black; three oblique

white spots on the costa towards apex; fringe golden at apex, otherwise whitish with a faint golden tint; secondaries silvery white, the fringe slightly golden; head and thorax snow-white, a golden spot on each shoulder; abdomen pale shining brown; primaries below pale golden brown; secondaries silvery white, with a tapering basi-costal golden-brown patch; fringe and body below white, tinted with golden. Expanse of wings, 11 mm.

"Mountains of the hacienda of Cauquenes."—*T. E.*

SUPPLEMENTARY SPECIES.

XYLINIDÆ.

Argyritis, *Hübner*.

Argyritis pura, n. s.

Allied to *A. argentina*; primaries above golden brown, with a broad tapering subcostal metallic silver band from base to apex, widest towards the end of the cell, slightly arched; a narrow abbreviated silver line near the inner margin, and another close to the outer margin; fringe pearly white; secondaries semitransparent pearly white, with a bronze-brown external border, tapering towards the anal angle; fringe white; head and thorax chalky white, sordid; two contiguous bare brown spots just behind the head; abdomen pearly grey; primaries below greyish brown, with white submarginal stripe and fringe; secondaries pearly white; body white; legs brownish. Expanse of wings, 29 mm.

Chili.

Received, with one or two other species, from Mr. Edmonds subsequent to the completion of my papers upon the groups to which they were referable; it comes nearest to *A. argyrina* of Guenée from Monte Video, but the latter species differs from it in having a broad internal band on the primaries, "une large bande au bord interne, d'un blanc d'argent brilliant," whereas in *A. pura* there is only a slender abbreviated line.

PHALÆNOIDÆ.

ARCHIEARIS, *Hübner.*

Archiearis pusilla, n. s.

Primaries above dark grey, crossed by three or four irregular black lines; a longitudinal orange streak, tapering from its outer extremity below the median vein, interrupted by the marginal border and outer discal line; fringe with a pale brown basal line; secondaries bright orange; base longitudinally streaked with black; a rounded spot at the end of the cell, an angular discal stripe, and the outer margin, which is connected below the middle with the angular stripe, black; body black; primaries below orange-ochreous, with greyish internal border; a spot at the end of the cell, and a sinuous discal line, black; apex and outer margin dark brown; a small white subapical costal spot; secondaries paler than above (pale buff excepting in the middle) with black markings as above; body below grey. Expanse of wings, 24 mm.

"Valparaiso, throughout the summer."—*T. E.*

ENNOMIDÆ.

EUGONIA, *Hübner.*

Eugonia undilineata, n. s.

Cream-coloured; primaries with the basal four-fifths and the external border densely striated with ochreous; two brownish olivaceous stripes, the first Σ-shaped across the basal third, the second limiting the striated area near the external third, and widely undulated; a black dot at the end of the cell; secondaries with ochraceous-speckled external border and testaceous fringe; a minute black dot at the end of the cell; thorax ochreous; head and abdomen pale creamy buff; under surface cream-coloured, sprinkled, especially on the costal areas and external borders, with ochraceous scales; a few widely scattered minute black scales; fringes ochreous; a black spot at the end of each cell, and beyond it a wavy ochraceous discal stripe; pectus ochreous; anterior legs above brown, banded with white; the tarsi white, banded with pale brown; other legs whity-brown. Expanse of wings, 39 mm.

Chili.

A species of the family *Hepialidæ* has been described by Berg in the 'Anales de la Sociedad Científica Argentina' for 1882 (April to June), p. 30, n. 31, under the name of *Æpytus dimidiatus*, from Chili; it appears to be a large and fresh male of my *Dalaca hemileuca*, of which it will in that case be a synonym.

Five other Geometers must be also added to Mr. Edmonds' captures :—

An apparently new genus of *Macariidæ*, which at present I hesitate to name owing to its imperfect condition; it is a pretty silvery-white species, the primaries crossed by an ill-defined angulated darker band, black-edged towards costa, and enclosing two orange spots. It was obtained from Reed's collection, and was probably captured in Valdivia.

The second species is an *Ypsipetes*, very aberrant in colouring, and which, therefore, puzzled me greatly.

Ypsipetes chiloënsis, n. s.

Primaries above sandy yellow, sparsely speckled with black, and traversed by two series of black spots indicating the limits of the ordinary central belt; a third series upon the outer margin; an oblique blackish dash just above the middle of the external area; fringe spotted with blackish; secondaries much whiter than the primaries, but still of a pale sandy yellow tint irrorated with grey; an oblique grey dash across the abdominal area beyond the middle; a marginal series of depressed blackish spots; body coloured in accordance with the wings, the thorax being darker than the abdomen; primaries below washed with smoky grey, excepting at the borders, which are black-speckled; only the outer series of black spots visible; an additional black spot at the end of the cell; secondaries cream-coloured, irrorated with brown; a small blackish disco-cellular spot and a zigzag discal line; body below cream-coloured; legs irrorated with greyish. Expanse of wings, 35 mm.

"Chiloë, from Reed's collection."—*T. E.*

There are also two very worn specimens from the Cauquenes of what probably represent a new species of *Selidosema*: they are not good enough to describe. With the latter I found associated four examples of what I

believe to be Blanchard's *Tephrosia undularia* (also in very bad condition); if I am right in my supposition, the species must be referred to the genus *Eubolia*.

Lastly, a species of *Psaliodes* appears to have been overlooked; it is a very distinct form, and is represented by three male examples in Mr. Edmonds' collection.

Psaliodes mathewi, n. s.

Pale smoky brown, with a faint pink gloss; base darker, with angular outer edge, two parallel subbasal dark brown lines, followed by a blackish-edged narrow dark band forming the inner limit of the central belt; a short distance beyond this is a second somewhat similar band forming the outer limit of the central belt, and between the two is a conspicuous small black discocellular spot; disc reddish towards the centre, crossed by three irregularly undulated parallel dark brown lines, and interrupted upon the external area by a large, almost wedge-shaped, greyish white patch, with sinuated inner edge, extending from near apex to the first median branch; fringe flesh-tinted, traversed by two grey stripes, the inner one interrupted by a series of black spots; secondaries crossed beyond the middle by three irregularly arched parallel grey stripes; fringe crossed by a grey stripe; thorax greyish; collar varied with dark brown; abdomen pale brown; under surface shining greyish brown, with cupreous reflections; wings crossed by a pale discal band, margined and intersected by three undulated dark grey lines; a very slender interrupted black marginal line; fringe in certain lights showing the stripes of the upper surface. Expanse of wings, 22 mm.

"Valparaiso, in March."—*T. E.*

Explanation of Plate XI.

Fig. 1. *Phycopterus flavellus*, Blanch., p. 54.
2. *P. signariellus*, Blanch., p. 54.
3. *Taseopteryx sericea*, Butl., p. 64.
4. *Œnectra fulvaria*, Blanch., p. 68.
5. *Arctopoda maculosa*, ♀, Butl., p. 67.
6. *Teras blanchardii*, Butl., p. 64.
7. *T. walsinghamii*, Butl., p. 65.
8. *Callistenoma zelleri*, Butl., p. 80.
8*a*. Palpus of the same.
9. *Agriocoma mimulina*, Butl., p. 83.
9*a*. Palpus of the same.
10. *Pisinidea viridis*, Butl., p. 83.
11. *Palæphatus falsus*, Butl., p. 82.
12. *Cryptolechia phœnissa*, Butl., p. 81.
12*a*. Palpus of the same.
13. *Pachyphœnix sanguinea*, Butl., p. 81.
13*a*. Palpus of *Pachyphœnix*.

IV. *Revision of the species included in the genus* Tropisternus (fam. Hydrophilidæ). By D. Sharp.

[Read December 6th, 1882.]

In working out the *Hydrophilidæ* for the 'Biologia Centrali-Americana,' I found so much difficulty in discriminating the species of *Tropisternus*, and such great confusion prevailing about those already described, or, perhaps I should rather say, named, that I have been obliged to submit the whole of the genus to a careful revision. For this purpose I have used only the specimens extant in my own collection, and a set of types of the North American species kindly lent me by Dr. Horn: but as several of the older French collections have come into my possession, I have had sufficient material to enable me to elucidate most of the species enumerated in the Munich Catalogue, and to distinguish a few new ones. The difficulty of identifying the older descriptions is extreme; for these insects, like most other water-beetles, are very similar to one another in colour, form, and such minor characters as in other families of Coleoptera are readily perceived, and make the distinction of species by cursory inspection easier than it is in the case of the water-beetles. Careful examination has revealed some important characters for grouping the species, and when the structural characters, by which the members of the different groups are characterised, are appreciated, the task of discriminating the species becomes comparatively easy, for it is frequently species of two quite different groups that bear the greatest superficial resemblance to one another. Even after all my efforts, however, I leave a great many questions of specific identity unsolved, and it is quite possible that the species are considerably more numerous than those the method I have adopted has induced me to promulgate. Among the first points to which I directed my attention was the finding of an external means of distinguishing the two sexes; for the front feet, which are usually of such assistance for this purpose, are in *Tropi-*

sternus quite similar in the males and females. I have found, however, that in the males of a great number of the species there is a small tooth or spine on the under surface of the inner claw on the hinder and middle feet; and although there are a few species in which I have not detected this external sexual mark, I believe it will ultimately be found to exist in all species of the genus. In a few species there is a peculiar sexual difference in the sculpture of the mentum, the males having this part more densely punctate than the other sex. These are the only certain external sexual characters I have been able to detect.

In the hope that the structure of the œdeagus might afford a means of distinguishing the species, I have examined it in several forms selected for the purpose, but I find that not only is this organ remarkably minute in the species of this genus, but that it is also excessively similar even in very widely different species.

The difficulty of distinguishing the species is increased by the fact that two forms of what I may call adventitious sculpture exist in certain individuals of several species. The first of these peculiar sculptures is a pitting of the surface, giving rise to a variolose appearance, and often occurring with great regularity over the whole of the upper surface; this peculiarity, which is not, I believe, variation, but more probably dependent on some physical condition to which the specimen possessing it is subjected during its metamorphosis from the pupal condition, occurs in numerous other *Hydrophilidæ* and *Dytiscidæ*, and is not unfrequently alluded to by describers as being a specific character. The second form of adventitious sculpture consists in the appearance in certain individuals of two lines of punctures near the outer margin of the wing-case, or near the suture; this character also can scarcely be considered variation, but I believe it depends on the fact that although the species of the genus appear externally to be without series of punctures on the wing-cases, yet in reality these exist in the interior of this part (they are in fact more or less conspicuous on the inner face of the wing-case according to the condition of the membrane covering this face) and become occasionally evident externally if the chitinous substance be a little thinner than usual, or from some other cause.

After eliminating these sources of confusion, and after

arranging the species in groups, there is still much difficulty in distinguishing the species, owing to the variability in some other points. The most important of these is the spine or carina frequently apparent on the last ventral segment; this in certain species, e. g., *H. apicipalpis*, is very constant in its size and form, but in others (especially in *H. lateralis*) it is excessively variable, unless it be the case that more than one species is mixed together in these cases of apparent variability. There seems some probability that this latter may be the case, because in the species last named the crest is quite absent in South American individuals, but is nearly always present in individuals from the United States of North America. In Central American individuals it is present in various degrees of development.

A fact of some interest is the presence in numerous species of the genus of an excessively fine squamosity on the polished surfaces of the hind tibiæ and tarsi. This is somewhat similar to what we find existing more conspicuously in *Eretes*, of the family *Dytiscidæ*; it is excessively delicate and very easily removed, and is of interest to the evolutionist inasmuch as it may be considered to be the remnant of a structure formerly more developed, but now in process of disappearing. This peculiarity may be well observed in the common species, *T. nitens*, Cast.

It is still more interesting to observe that in the case of *Eretes* and *Tropisternus* this peculiarity of the squamose swimming legs is accompanied by another common to the two, and almost (if not altogether) confined to them amongst their allies, *viz.*, the existence on the epipleural margin of short rigid spines. In the *Tropisterni* each of these spines is inserted in a large puncture or depression, the shape of which apparently adapts it to receive the spine when depressed, and there is no doubt these spines are mobile and capable of being depressed or erected; these peculiarities present some valuable specific characters, and may be seen to advantage in *Hydrophilus apicipalpis*.

In discussing the characters of some of the species I have made use, in speaking of some punctures on the head and thorax, of the term "systematic punctures"; I allude by this to some punctures which are present with great constancy in the *Hydrophilidæ* on these parts

of the body. On the head there is a series on the clypeus commencing on each side in front of the eye and extending forwards, till near the front of the clypeus it changes its direction by a curve, extending backwards, and converging with its fellow of the other side towards the mesial line of the back of the clypeus; besides this looped series there is a patch of punctures on the inner margin of the eye; on the thorax there is a lateral line of punctures placed at a little distance from the side about the middle of the length, and there is also an anterior series consisting of two or three punctures placed near the front of the thorax behind the eye on each side. I have not made so much use, as I think I might have done with advantage, of these systematic punctures, and content myself with pointing them out and recommending that attention should be paid to them by future students.

As regards the validity of the genus *Tropisternus*, I must say that though it has not been admitted by some of our best entomologists, it appears to me incontestable. It was established by Solier in the 'Annales de la Société entomologique de France,' 1834, p. 308, by a dismemberment from *Hydrophilus*, in which its species had before been included; it differs from *Hydrophilus* by the different proportions of the articulations of the maxillary palpi, the penultimate joint of which is shorter than the terminal one, while in *Hydrophilus* the contrary proportion prevails; the ventral segments in *Tropisternus* are entirely pubescent, while in *Hydrophilus* they always have a large glabrous area. There are also other minor differences, of which an important one is the size of the individuals: the largest *Tropisternus* only attains about 15 mm. of length, while the smallest *Hydrophilus* has about 25 mm., and the largest attains about 45 mm. I think it is clear that we have here an aggregate quite distinct from *Hydrophilus*.

Altogether I have discriminated thirty-five species, but two of these form a distinct new genus on account of the structure of the margins of the wing-cases; the other thirty-three species are arranged in ten groups, the ten groups forming two very distinct sections. In the Munich Catalogue of Coleoptera thirty-two species are recorded under the genus; of these some half-dozen are mere synonyms; one must be rejected as not belonging to the genus; and about half a dozen others cannot be

identified with any species I know. At the end of this paper I have added some short observations on these doubtful names.

Section A.

Posterior tibiæ entirely destitute of cilia (or swimming-hairs). This section comprises six groups.

Group 1. *Species having the fissure on the middle of the prosternum open in front as well as below.* (*Species* 1 *to* 6). *In all the other groups the divided prosternum is closed in front.*

The insects combined in this group appear to be extremely closely allied, the distinctions being chiefly in the details of coloration. They all have the upper surface yellow, with metallic green parts on the head, thorax, and elytra: these green marks are placed on the posterior part of the head; on the middle of the thorax; and on the wing-cases, where they are longitudinal stripes or vittæ; in certain species some or all of these metallic marks become of increased extent so as nearly to cover the whole area of the part on which they are situated, but the margins always remain pale. In other respects the species agree very closely. The epipleural margin is punctate, but the upper edge, on which the punctures are placed, is very narrow, so that the punctures readily escape observation, although they are in fact large and placed very close to one another; they bear no visible spines, but when the tip of the finger or the edge of a hard instrument is passed over them they are found to be extremely asperate; they are confined to the posterior half or two-thirds of the margin, no trace of them being visible on the basal portion. The upper inner face of the hind tibia is highly polished, but when examined with a good magnifying-power is seen to be obsoletely sculptured, the shallow punctures being filled up by an extremely fine squamosity. The outer face of the tibia is asperate, with coarse punctures and erect spines, and the line of demarcation between the armed outer face and the smooth inner one is straight, being formed by a series of coarse punctures; the posterior punctures of this series are not closer to one another than are the basal punctures; they do not diverge (or encroach) on the smooth inner face and are not armed with fine erect setæ. The sternal spine is very acuminate, not flat,

much curved away from the body, and is quite as long as the space between the middle and hind coxæ. The pubescent space on the base of the hind femur is of moderate size, covering about one-fourth of the whole area of the lower face. The tooth on the claw of the middle and hind feet of the male is placed quite near the apex, and there is no other external mark of distinction between the sexes, so far as I can observe. The last ventral segment is unarmed, except that there exist two or three elongate setæ in the middle near the hind margin. The uniformity in structure of the species appears very complete, and if it were not for the absence of intermediate forms they might all be considered as varieties of one widely-distributed species.

As regards the peculiarity on which I have specially based the group, I may remark that it was first pointed out by Leconte, and that one effect of the peculiarity is to allow a more complete contraction of the prothorax on to the after-body, owing to the raised mesosternal keel being able to pass slightly beyond the front margin of the fissured prosternum. The group will no doubt ultimately be treated as a distinct genus.

1. *Tropisternus scutellaris*, Cast.

Cast., Hist. Nat., ii., p. 54.

Hydrophilus lepidus, Brullé, Voy. d'Orb., Ins., p. 57.

Brazil. (Buenos Ayres).

This species is very closely allied to *Hydrophilus collaris*, but the metallic lines on the wing-cases are extremely diminished, and, indeed, are represented only by four small, short streaks placed near the suture, two just behind the middle and two near the extremity; one or more of these small streaks is occasionally quite obliterated. The epipleural margin is provided with punctures which, although they do not reach to the shoulder, are more distinct in front than they are in *H. collaris*. The under or inner claw on each of the middle and hind feet is in the male dentate near the extremity; this is the only external sexual character I can detect.

This species appears to be rare.

2. *Hydrophilus collaris*, Fab.

Fab., Ent. Syst., i., p. 184.

Tropisternus collaris, Cast., Hist. Nat., ii., p. 54.

South America, from Caracas to Entre Rios; Panama; Mexico?; St. Domingo?. Panama; Caracas, Cumana; Colombia; Ega, Tapajos; Bahia; Rio de Janeiro; Santa Cruz.

In this species the yellow elytra are marked with longitudinal stripes of a metallic-green lustre. These stripes are four in number, in addition to the suture, which also is green; they are not quite straight, and are usually broader than the spaces of the yellow ground colour by which they are separated; behind the middle two or more of them frequently unite; the 2nd and 3rd of these green stripes are longer behind than the other two, and when carefully examined it is seen that their hinder parts are portions grafted (as it were) on to the anterior portions, there being left a more or less distinct irregularity at the point of juncture, which is an overlapping one; the lateral portion of the wing-cases is always broadly pale.

The species is apparently a very abundant one in South America, and varies a little in colour, but not very much; the metallic mark on the middle of the thorax varies a little in width, and is sometimes a mere line, and is never quite half as broad as it is long, but its width and definiteness are frequently rendered indistinct by its being surrounded by a cloud of fuscous or dark colour, probably the result of decomposition of the prothoracic muscular tissue. The epipleural margin is very fine behind the middle, so that the punctures on it are not easily detected, and cannot be traced at all in front of the hind border of the posterior coxæ.

St. Domingo was given as the locality for an individual in Doué's collection; and in that of the late W. W. Saunders there were several individuals labelled Mexico.

3. *Tropisternus proximus*, n. s.

Superne testaceus, vertice, linea mediali prothoracis, scutello, lineis quatuor elytrorum aliisque fractis interjectis viridi-metallicis. Long. 9—10 mm.

Cuba.

This differs only from *Hydrophilus collaris*, Fab., by the fact that the green marks I have spoken of in *H. collaris* as being grafted on to the posterior portions of the 2nd and 3rd green lines on the wing-cases are in *T. proximus* not joined thereto, but are continued forwards on the yellow interstice as separate (more or less broken up) lines. In *T. mexicanus* these intercalated lines exist entire, not broken up as in *T. proximus*. Whether this peculiarity of markings really indicates a distinct species I cannot say, but it appears to me at any rate an interesting local race; and I could not say whether, if a race, it is an offset from *Tropisternus mexicanus* or from *Hydrophilus collaris*.

The individuals in my possession are from old French collections, and some of them are labelled "*approximatus*," but I have preferred a shorter trivial name.

4. *Tropisternus mexicanus*, Cast.

Cast., Hist. Nat., ii., p. 54; Sharp, Biol. Cent. Am., i., pt. 2, p. 55, pl. ii., f. 3.

Central America, from Mexico to Nicaragua.

In this species there are six elongate green lines on each wing-case; in some individuals these lines are connected together into one large mass of dark colour by an infuscation or discoloration of the surface, and in such specimens there usually exists also a dark cloud round the central mark on the thorax; examples in this state resemble extremely the North American *H. striolatus*, but the punctuation of the wing-cases is less fine in this latter species. The sculpture of the epipleural margin is quite as indistinct in *T. mexicanus* as it is in *Hydrophilus collaris*.

5. *Hydrophilus striolatus*, Lec.

Lec., Proc. Ac. Phil., 1855, p. 357.

North America. (Southern United States); (Mexico?).

This is very closely allied to *T. mexicanus*, but the punctuation of the wing-cases is evidently coarser and more distinct, and the sculpture of the epipleural margin can be traced further forwards; the yellow intervals separating the green lines are usually very small, and frequently cannot be detected at all; the metallic colour

on the thorax occupies the greater portion of its area, leaving frequently only a narrow irregular border pale. The specimens before me seem to indicate that there may possibly be two distinct species mixed in collections, one characterised by the complete confluence of the metallic lines on the wing-cases, and the large development of the metallic colour on the thorax would then be new. I have an individual of this dark form labelled as being from New York, but I do not know whether this be correct, and Leconte records the species only from the Southern States. The Mexican habitat requires confirmation, as it is given on the authority of an individual from an old French collection labelled "*H. strigatus*, Chevrolat, Mexique."

6. *Tropisternus parananus*, n. s.

Superne viridi-fuscus, pernitidus, limbo testaceo; pedibus testaceis, femoribus basi nigricantibus. Long. 9 mm.

Parana.

This species is similar in colour to *Hydrophilus striolatus*, but in sculpture to *H. collaris*. The head and thorax are of a metallic colour, with the front margin of the former and the sides of the latter yellow. The stripes on the elytra are placed as in the South American species, but are connected by fuscous colour into a large mass of dark colour, leaving only the lateral margin yellow. The sculpture of the epipleural margin is quite as indistinct as it is in *H. collaris*.

I have before me only a single individual.

Group 2. *Sternal spine flat and broad, quite short, not extending further backwards than the first visible ventral suture; maxillary palpi shorter than in any of the other species; setigerous punctures on each side of prothorax agglomerated into a small depression having the appearance of a single large puncture; pubescent area on posterior femur almost absent.* (*Species* 7 *to* 9).

The species of this group appear to be rarer than the other *Tropisterni*; their individuals have the upper surface unicolorous, and the epipleural margin is either

crenate-punctate or smooth. I have not found amongst the individuals in my collection any with the claws toothed, and am not aware that any external mark by which the sexes may be distinguished exists.

7. *Tropisternus breviceps*, n. s.

Crassus, latus, sat convexus, niger, nitidus, parum metallescens, palpis concoloribus, crebre subtiliter punctulatus ; mento fortiter punctato ; elytrorum linea marginali lævigata. Long. 11 mm., lat. 6½ mm.

Brazil (from Reiche's collection under the name of *T. crassus*).

I have before me only a single individual of this peculiar species, remarkable for its short broad form. The palpi are remarkably short, and are dark in colour. The mentum is shining, but is deeply and rather coarsely punctate. The posterior punctures of the clypeal series are reduced to two or three on each side ; the punctures near the inner margin of the eye are numerous, but are irregularly placed. The hind tibiæ have a series of punctures bordering their smooth internal face ; each of these punctures bears a short fine spine, the series does not extend to the apex, and the terminal punctures are not different from the others. The sternal spine is short and broad, and its apex is carinate in the middle. The last ventral segment is not carinate, but bears at the extremity a minute and short, rather thick, pencil of setæ. The pubescent area of the posterior femur is confined to a small space extending along the anterior margin.

8. *Tropisternus brevicollis*, Sharp.

Sharp, Biol. Cent. Am., i., pt. 2. p. 56, pl. ii., f. 4.

Mexico.

Allied to *T. breviceps*, but of much narrower form, with the surface less punctate, and the clypeal and orbital punctures still more reduced ; the mentum is less punctate ; the sternal spine not so short and broad, not carinate ; the last ventral segment plicate along the middle, the fold, however, but little elevated. The unique individual in my possession was compared with Dejean's collection of *Hydrophilus* by Mulsant at the time this passed into the possession of the Lyons Museum, and was marked as a species "not in Dejean's collection."

9. *Hydrophilus nitidulus*, Brullé.

Brullé, Voy. d'Orb., Ins., p. 55.

Brazil (Rio de Janeiro) ; (Mexico, in coll. Laferté).

This species is readily to be distinguished from the others of its group by the punctate or crenate epipleural margin, the sculpture not, however, extending to the base. The hind legs are elongate and slender, the marginal series of punctures has the apical punctures so crowded together as to be nearly confluent into a groove, and each bearing a fine, short, erect seta. The apical ventral segment is strongly carinate, and the apex of the carina projects as a short spine.

The individual, supposed to be from Mexico, is of smaller size than the Brazilian examples, and is of more metallic colour, and the apex of the abdominal carina is less spinose. It may prove to belong to a different species. The specimen is unfortunately in very bad condition.

Group 3. *Sternal spine flat and broad, rather short, but extending backwards a little beyond the first ventral suture ; maxillary palpi elongate ; setigerous punctures on each side of prothorax agglomerated into a small depression ; pubescent area on posterior femur of moderate extent ; posterior tibia with its smooth inner face limited above by a series of punctures which do not extend to the extremity, the apical punctures crowded so as to be almost confluent into a groove, which diverges slightly on to the polished inner face, and each bearing a fine, short, erect seta.* (*Species* 10 *to* 13).

The species of this group are apparently not common, and are very closely allied in all structural points, although one of them is remarkable from the unusual development of the eyes. The size and form of the pubescent area on the hind femur seems very similar in all the species ; at the hind margin its limit extends just beyond the apex of the trochanter, and stretches across the femur in an oblique manner, reaching further outwards as it goes forwards, so that on the front margin it extends about two-fifths of the length of the femur ; altogether it covers about one-fourth of the whole area of the lower face of the femur.

10. *Tropisternus oculatus*, Sharp.

Sharp, Biol. Cent. Am., i., pt. 2, p. 58, pl. ii., f. 6.

Mexico; South America; Colombia.

This species may be readily distinguished from all others known to me by the larger eyes; the upper surface is of an olivaceous tint, and the maxillary palpi, as well as the ventral spine, are very elongate. In the individual labelled "New Grenada" in my collection the systematic punctures near the side of the thorax are not concentrated into so minute a fovea as they are in other individuals. The habitat Mexico is undoubtedly correct, Mr. Godman having recently received two individuals from Presidio; the species existed in Doué's collection, labelled "*H. congener*, South America"; it was also in Reiche's collection, labelled "*H. xanthopus*, Reiche, Colombie," and in Laferté's, where it was ticketed "New Grenada."

11. *Tropisternus flavipalpis*, n. s.

Superne niger, metallico-tinctus, antennarum basi palpisque testaceis, pedibus rufis, femoribus basi nigris; subtilius punctatus, pernitidus; elytrorum linea marginali subtiliter crenato-punctata, in dimidio basali lævigata; abdominis apice sat longe spinoso. Long. 11 mm., lat. $6\frac{1}{3}$ mm.

Mexico (from W. W. Saunders' collection).

This is very similar to *T. oculatus*, but the eyes are not so largely developed, and the ventral spine is less elongate. Although I have described the epipleural line as without punctures on the anterior half, yet by careful examination, with a very strong lens, of a perfectly cleaned specimen, very minute punctures can be detected. The only individual I have seen is apparently a male, but the tooth on the claws is placed at the extreme base, on the swollen part of the claw, and thus is not easily detected.

12. *Tropisternus chontalensis*, Sharp.

Sharp, Biol. Cent. Am., i., pt. 2, p. 57.

Central America.

This is extremely close to *T. flavipalpis*, but the legs are darker, and the apical ventral segment bears a very

strongly elevated carina, the apex of which is liberated so as to form only a very short spine. The unique individual appears to be a female; at any rate I can detect no trace of a tooth on the claws.

13. *Tropisternus robustus*, n. s.

Niger, superne subviolaceo-tinctus, antennarum basi palpisque testaceis; subtilius punctatus, pernitidus, elytris versus apicem fere lævigatis; elytrorum linea marginali fortiter punctata; abdominis apice longius spinoso. Long. 12 mm., lat. 7 mm.

Ecuador (found by Mr. Buckley).

Var. Femoribus versus apicem rufescentibus, abdominis spina paulo minore. (Hab. Cayenne?; from Doué's collection under the name of *Hydrophilus femoratus*, Buquet).

This species is rather more robustly built than its allies, and may be readily identified by the sculpture of the epipleural margin, which is conspicuous along the whole length. I have not detected a tooth, in the few specimens at my disposal, on the claws. The two individuals found by Mr. Buckley have the legs darker than those from the old French collections, and it is possible that ultimately these latter may prove distinct.

Group 4. *Sternal spine very elongate and not in the least flattened, much curved away from the body; other characters as in Group* 3. *A single species only is yet known*, viz.:—

14. *Hydrophilus latus*, Brullé.

Brullé, Voy. d'Orb., Ins., p. 55, pl. iv., f. 3.

Monte Video.

This species is an extremely remarkable one from the large size of its individuals and the greatly developed sternal spine; thus it can be confounded with none other of the species without cilia on the hind tibiæ. I find a variation in the length of the sternal spine, which in certain individuals extends quite as far back as the third ventral suture, while in others it is a little shorter; I think it possible these latter may be the females. I have not detected any other character by which I can

distinguish the sexes. The epipleural margin is conspicuously punctured up to the base, and the ventral spine is elongate and rather slender.

Group 5. *Sternal spine broad and rather flat and short, but extending beyond the first ventral suture; pubescent area of posterior femur of large extent, occupying about one-half of the lower face of the femur; last ventral segment armed with elongate spine; stature large.* (*Species* 15 *to* 17).

15. *Hydrophilus apicipalpis*, Chev.

Chev., Col. Mex., fasc. 3.

Mexico; Guatemala; Colombia; Cayenne.

This species is of large stature, and usually black in colour, with a slight æneous tinge, but occasionally the surface shows somewhat brilliant metallic reflections; the punctuation of the wing-cases is very dense and even, and, although very fine, is quite distinct, and there may always be detected (when a specimen is well cleaned) on each wing-case the rudiments of seven or eight striæ formed by lines of very fine punctures. The form is peculiar, the hind portion of the wing-cases is more elongate than usual, and so the posterior part of the body appears more acuminate. The male has a very fine tooth at the base of the under claw on the middle and hind feet.

16. *Tropisternus chalybeus*, Cast.

Cast., Hist. Nat. ii., p. 53.

T. nitidus, Cast., *l. c.*

Hydrophilus chalybeatus, Curt., Trans. Linn. Soc. xix., p. 42.

Mexico; Guatemala; Panama; Colombia; Cayenne; Amazons (from water standing in a canoe, Rio Sappo, 21st Nov., 1874, Prof. Trail); Brazil; Guadeloupe.

This species is readily distinguished by the beautiful colour of the upper surface, which is violet, purple, or blue. It varies a good deal in size and in the colour of the legs, but I am unable at present to distinguish more than one species. I have preferred the trivial name of *chalybeus* to that of *nitidus*, although the two were published at the same time, because there exists also a *nitidulus* and a *nitens* in the genus.

17. *Tropisternus crassus*, Sharp.

Sharp, Biol. Cent. Am., i., pt. 2, p. 55.

Guatemala.

Very closely allied to *T. chalybeus*, and approached on one or more points by some of the varieties of that species, but of shorter and broader form, with the legs shorter, and the pubescent area on the femora comparatively a little larger.

Group 6. *Sternal spine not flat, acuminate, of moderate length, extending nearly or quite to 2nd ventral suture; pubescent area of posterior femur of moderate extent (occupying about one-fourth of the whole area of the lower face); last ventral segment unarmed.* (*Species* 18 *and* 19).

The two species of this group are not closely allied. *T. nitens* is variable in size and form, and is more likely to cause difficulty in its identification than any other species of the genus, owing to the superficial resemblance it possesses to species of other groups. *T. ovalis*, on the other hand, is, by its small size and peculiar form, more readily distinguished at a glance than any other species of the genus. In both species the epipleural margin is punctate even at the base.

18. *Tropisternus nitens*, Cast.

Cast., Hist. Nat., ii., p. 54.

From Mexico to Rio de Janeiro. (Mexico; Guatemala; Colombia; Venezuela; Demerara; Bahia; Rio de Janeiro; Santa Cruz).

In this species the 6th joint of the antenna is slightly larger than in most others of the genus, but is a good deal smaller than it is in *T. ovalis*. It is one of the most abundant species of the genus, and varies much; the length is between $6\frac{1}{2}$ mm. and $10\frac{1}{2}$ mm.; the colour of the upper surface is usually shining black, but sometimes is strongly metallic; the form is rather narrow, and sometimes attenuate behind, sometimes rounded.

19. *Tropisternus ovalis*, Cast.

Cast., Hist. Nat., ii., p. 54; Sharp, Biol. Cent. Am., i., pt. 2, pl. ii., f. 5.

From Mexico to Bahia. Oaxaca; Guatemala; Colombia (Coll. Reiche); Bahia (Coll. Castlenau).

The individuals of this species are of smaller size than others of the genus, except the smallest individuals of *T. nitens*; the form is peculiarly short and broad, the greatest width being near the extremity behind, and the punctuation of the upper surface is more distinct and less dense than usual; these characters, in combination with the unusual development of the 6th joint of the antenna, permit the easy identification of the species; it appears to be rare in collections.

Section B.

Posterior tibiæ with an elongate series of swimming-hairs placed in a groove extending along the outer margin of their upper-inner face, from the knee to near the extremity.

This section comprises groups 7 to 10. The species in this section are more closely allied *inter se* than are many of the species of the A section, and I have separated them into groups merely to facilitate the determination of species.

Group 7. *Upper surface without yellow cincture, the margins being nearly or quite concolorous; epipleural margin distinctly punctate from the humeral angle to near the extremity.* (*Species* 20 *to* 27).

In this group I have placed eight species; the first two of these, *Tropisternus concolor* and *Hydrophilus ellipticus*, have the lateral systematic punctures on the thorax reduced to one or two on each side, while in all the other species they form a short, sometimes irregular, line of five or six punctures. In all the species the sternal spine is of moderate length, or is rather elongate; it is never short or flattened beneath; the pubescent area at the base of the hind femur is either small or very small. The armature of the last ventral segment is very variable in this group of species.

20. *Tropisternus concolor*, Sharp.

Sharp, Biol. Cent. Am., i., pt. 2, p. 57.

Mexico and Guatemala.

This species, by the deep coarse punctures on the epipleural margin, resembles *T. nigrinus*, but *T. concolor* is of shorter and broader form, more rounded behind, with the sculpture of the upper surface excessively fine, and the systematic punctures at the side of the thorax are more concentrated, for, while in *T. nigrinus* they form a moderately short line, in *T. concolor* they are nearly or quite concentrated into a group placed in a small round depression.

21. *Hydrophilus ellipticus*, Lec.

Lec., Proc. Ac. Phil., 1855, p. 368.

North America (New Mexico, California, Utah).

This species is readily distinguished from its North American allies by the fact that the systematic punctures on the side of the thorax are much reduced, there being only two, placed very near one another (or even amalgamated), but occasionally at a distance on one or both sides of these may be seen another much finer puncture, marking the beginning or end of the series as it exists in other species. The form is broader and more obtuse behind than it is in *H. californicus* and *H. sublævis*; the upper surface is very polished, and its sculpture extremely fine; the punctures on the epipleural margin are very distinct from the shoulder backwards; the sternal spine is formed much as in *H. californicus*; on the last ventral segment there is only a very obscure carina, and the pubescent area at the base of the posterior femur is small; the legs are dark, but marked with yellow. There appears to be little or no sexual difference in the sculpture of the mentum.

I have seen only three individuals, from California and Utah.

22. *Tropisternus nigrinus*, Boh.

Boh., Eugen. Resa, Coleoptera, p. 22.

Brazil; Rio Grande, Parana, Corrientes; Monte Video (*fide* Boheman).

This species bears an extreme resemblance to some of the varieties of *T. nitens*, but can be readily distinguished by the ciliate posterior tibiæ. The sternal spine is rather short and stout, not extending quite so far as the hind margin of the 2nd ventral segment; it is punctate, but not quite flat, and is thick in the vertical direction. The apical ventral segment has only the rudiment of a carina. The punctuation of the elytra is very fine, that of the epipleural margin quite coarse, even at the base. The legs are rather short and stout, usually dark in colour, and the upper face of the hind tibia is rather closely squamose-punctate.

I have had some doubt in determining this to be Boheman's *T. nigrinus*, but, although he does not allude to the important facts as to the condition of the tibiæ, epipleural margin, &c., his description on the whole accords better with this species than with any other I know, and I have therefore applied his name to it. Most of the individuals I have seen are from old French collections, and are labelled either "*ebenus*, Dej.," or "*geniculatus*, Klug."

23. *Hydrophilus ochripes*, Curt.

Curt., Trans. Linn. Soc., xix. (1845), p. 443.

Chili; Bolivia; Southern Brazil; La Plata; Buenos Ayres; Monte Video; Corrientes; Rio de Janeiro.

In this species the legs are nearly always yellow; the punctuation of the upper surface is fine and regular, but quite distinct; although the epipleural margin is not broad, its punctuation is quite distinct even at the shoulder; the sternal spine is slender and elongate, reaching as far as the extremity of the 2nd ventral segment, and is without punctures; there is only a very faint indication of any carina on the last ventral segment. The more slender elongate and glabrous sternal spine readily distinguishes this species from *T. nigrinus*.

The description of Curtis, though brief and without allusion to any of the most important characters, applies better to this species than to any other known to me, and as the habitat he gives ("Valparaiso and Brazil") also agrees, I have used his name without much hesitation; he describes the upper surface as being "piceous, with a violet tint"; this is sometimes the case, but more frequently it is nearly pure shining black.

The species appears to be a common one.

24. *Hydrophilus sublævis*, Lec.

Lec., Proc. Ac. Phil., 1855, p. 368.

Hydrophilus quadristriatus, Horn, Trans. Am. Ent. Soc., 1871, p. 331.

North America.

This species appears to be closely allied to *H. californicus*, but to be narrower and smaller, and with the pubescent area at the base of the hind femur rather larger; the apical ventral segment has a strongly elevated carina, the apex of which projects beyond the extremity of the segment. There seems to be no sexual difference in the sculpture of the mentum. In other respects the species seems very similar to *H. californicus*.

I have seen only a pair of the species, so can form no opinion as to its variation; in both these individuals the legs are nearly entirely pale yellow.

25. *Hydrophilus californicus*, Lec.

Lec., Proc. Ac. Phil., 1855, p. 367.

North America (California).

This species may be readily distinguished from *H. glaber* by its less punctate upper surface, and by the last ventral segment bearing only a carina or plica instead of the spine existing in *H. glaber*. The systematic punctures on the side of the prothorax form a somewhat short and irregular line; the sculpture of the epipleural margin is distinct from the shoulder backwards. The sternal spine is curved away from the body, and is elongate, narrow, and deep, formed, in fact, as in *H. glaber*, but scarcely so long and stout; the apical ventral segment bears a plica or carina; and the pubescent area at the base of the hind femur is quite small.

There is a striking sexual disparity in the sculpture of the mentum and the lateral portions of the submentum, the punctuation of these parts being much denser in the male than in the female.

The species is variable, and there may be more than one mixed under the name. In one form there is a well-marked development of coarse punctuation on the sides

of the elytra towards the extremity, while in other specimens this additional sculpture is quite absent; this latter form is usually of darker and less metallic colour.

26. *Hydrophilus glaber* (Herbst ?), Lec.

Lec., Proc. Ac. Phil., 1855, p. 368.

North America; Haiti.

In this species the punctuation of the upper surface is quite distinct and evenly distributed, but does not give rise to a dull appearance; the systematic punctures on the prothorax form a somewhat short line; the sternal spine is elongate and much curved away from the body, and is rounded beneath, not flattened; the apical ventral segment bears a very distinct free spine. The epipleural sculpture is coarse and distinct from the base to near the apex.

It appears to be variable, or there may be more than one species under the name; the pubescent area of the posterior femur is sometimes quite small, but in other cases is rather more extensive; the ventral spine also varies somewhat in its development.

It seems scarcely possibly that this species can be that intended by Herbst in his description of *Hydrophilus glaber*; he calls his insect "*glaberrimus*," and repeats that it has the head, thorax, and elytra quite impunctate, whereas the punctuation of the upper surface is in this species quite conspicuous, and more developed than in any other of the genus, except *H. mixtus*, Lec.

It appears to be abundant throughout the United States of North America.

27. *Hydrophilus mixtus*, Lec.

Lec., Proc. Ac. Phil., 1855, p. 368.

North America; United States; New York.

This is extremely closely allied to *H. glaber*, but the punctuation of the upper surface is much denser, so that the elytra towards the sides and extremity are dull. The pubescent area on the hind femur is larger than in some of the varieties of *H. glaber*, but other forms of this latter species have the area quite as extensive as in *H. mixtus*.

Group 8. *Upper surface with a yellow marginal cincture; epipleural margin rather finely punctate, the punctures distinct, however, even at the base.* (*Species* 28 *and* 29).

Two species are included in this group; they do not differ in any important respect from Group 7, but I have separated them because the yellow marginal band gives them a rather different appearance.

28. *Hydrophilus lateralis*, Fab.

Fab., Syst. Ent., p. 228.

America, North and South, including the Antilles. United States, from New York southwards, abundant; Mexico and Central America, abundant; Cuba, Antigua, St. Thomas; Rio Janeiro, Constancia, Buenos Ayres, Chili.

In this species the form is rather slender and elongate, and the upper surface shining, closely, very finely, and evenly punctate; the yellow cincture is subject to a good deal of variation in its width and regularity, but usually is narrower on the wing-cases than on the thorax, becoming on the former narrower as it proceeds backwards, so that it nearly entirely disappears before reaching the suture at the apex; the systematic punctures on the side of the thorax are fine and form a rather short irregular line; the epipleural margin is narrow, so that the punctures on it are not coarse, but they are quite distinct from the shoulder backwards; the sternal spine is rather elongate and slender, and the apical ventral segment is either unarmed or bears a carina or plica of variable elevation and length; the pubescent area at the base of the hind femur is quite small; the legs are yellow, with the femora infuscate to a variable extent. The male has a distinct tooth on the inner claw of the middle and posterior feet, and this is the only certain external sexual mark I can detect.

The species varies much in the breadth and regularity of the yellow cincture on the head, thorax, and wing-cases; sometimes it is broader on one or other of these, and sometimes, but rarely, on the wing-case it becomes rather broader and more irregular at the apex. The armature of the last ventral plate also varies greatly;

sometimes there is only a scarcely visible elevation bearing two or three setæ, while in other cases there is a strongly-elevated plica, the extremity of which projects backwards to a greater or less extent as a free spine.

I have been quite unable to arrange the numerous variations in such a way as to indicate distinct species; nevertheless it may prove that there is more than one truly distinct species mixed under the name. In South America the last ventral segment is apparently always simple, and in North America is never quite simple, but always more or less distinctly carinate or subspinose; in Mexico and Central America there exists a great deal of variation in this character.

29. *Hydrophilus dorsalis*, Brullé.

Brullé, Voy. d'Orb., p. 57, pl. 4, f. 61.

Hydrophilus limbalis, Lec., Proc. Ac. Phil., 1865, p. 367.

America, North and South. Arizona, California, New Grenada, Peru; Chili, Corrientes (*teste* Brullé).

So far as I can see, this insect is only different from *H. lateralis* by the greater extension of the yellow colour of the upper surface, the lateral band of the wing-case occupying about two-fifths of the width, and at the base nearly always extending inwards towards the scutellum.

If I may express an opinion, from the few specimens I have seen, I should say that, as in *H. lateralis*, the last ventral segment has its carina more developed in North America than in South America.

Group 9. *Upper surface without a yellow cincture; epipleural margin with rather fine and somewhat distant punctures at or behind the middle, but without sculpture at the shoulder.* (*Species* 30 *to* 32).

The three species I have here associated are separated from Group 7 merely as a matter of convenience in determining the species; *T. xanthopus*, in fact, has not the epipleuræ quite impunctate at the base, careful examination revealing fine punctures on this part.

30. *Tropisternus xanthopus*, Sharp.

Sharp, Biol. Cent. Am., i., pt. 2, p. 59.

Mexico (Oaxaca).

In this species also the legs are yellow. It is closely allied to *H. ochripes*, Curt., but is of more elongate and narrow form, the punctuation of the wing-cases is more distinct, and the sternal spine is shorter, though otherwise similar; the epipleural margin is narrow, and its sculpture on the basal portion obsolete.

31. *Tropisternus lancifer*, n. s.

Niger, parum metallescens, palpis antennarumque basi testaceis, pedibus rufis; latiusculus, minus convexus, capite thoraceque sat fortiter, elytris parce subtilissime punctatis; margine pleurali antice lævi, ad medium parce parum distincte punctato; spina sternali elongata, tenui; abdominis apice carina obscura sed ad marginem posteriorem distincte elevata. Long. 10—11 mm., lat. $5\frac{1}{2}$ mm.

Colombia.

Punctuation of head and thorax quite distinct and not close, their systematic punctures deeply impressed, those on the side of the thorax forming a short line; wing-cases sparingly and extremely finely punctulate; the epipleural margin is not punctate at the base, behind the middle it is narrow, and bears not very distinct distant punctures. The legs are elongate and slender; the sternal spine is elongate and slender, extending a little beyond the 2nd ventral suture; on the last ventral segment there is a short carina, which at the apex is distinctly elevated.

The species is readily distinguished from *T. ochripes* by the indistinct punctuation of the epipleural margin.

32. *Tropisternus fuscitarsis*, Sharp.

Sharp, Biol. Cent. Am., i., pt. 2, p. 58.

Mexico, Guatemala; Colombia (*fide* Mus. Castlenau).

This is a species in which the colour of the legs appears variable. It has the punctuation of the epipleuræ indistinct, as in *T. lancifer*, but is readily distinguished from that species by the shorter, more depla-

nate, sternal spine, and by the denser and more even punctuation of the upper surface, there being in *T. fuscitarsis* but little difference between the punctuation of the thorax and the wing-cases, this being very close and fine on both these parts, and even denser on the thorax than on the elytra. The systematic punctures on the side of the prothorax seem to be in this species more variable than usual; sometimes there are three or four of them forming a short irregular line, while more usually they are concentrated into a small fossa.

Group 10. *Epipleural margin quite destitute of sculpture or spines.*

The interesting species isolated to form this group makes a slight approximation to the genus *Pleurhomus* by the quite smooth epipleural margin.

33. *Tropisternus tinctus*, Sharp.

Sharp, Biol. Cent. Am., i., pt. 2, p. 59.

Mexico.

This species is readily identified by the complete absence of sculpture on the epipleural margin, and by the fact that the edge of the epipleura on the basal portion of the wing-case, when seen beneath, forms a less sharp edge than usual. There is an extreme sexual difference in the sculpture of the mentum, this part in the male being densely and finely rugulose-punctate and opaque.

Pleurhomus, n. g.

Structura fere generis *Tropisterni* sed elytrorum epipleuris pone coxas posteriores omnino angustis, haud ad faciem elytri interiorem applicatis; margine epipleurali omnino lævigato.

I have separated two species from the other *Tropisterni* on account of a peculiar structure of the margin of the wing-case. In the species of *Tropisternus* the epipleura behind the posterior coxæ is folded in, so that a line (which is the inner or lower margin of the epipleura) is seen running along the inner face of the wing-case at a little distance from its outer edge. In the two species of *Pleurhomus* this is not the case; the epipleura behind the

coxa becomes gradually narrower, but is not so abruptly turned in, till just before the extremity, where it is folded in and applied to the inner face, as in *Tropisternus*.

The two species are peculiar by their rather broad form, much attenuate behind; they are very distinct from one another, *Tropisternus obscurus* having the swimming-legs rather stout and their tibiæ ciliate, whereas in *Pleurhomus sahlbergi* the swimming-legs are slender and their tibiæ entirely destitute of ciliæ; thus the two species form two sections similar to what obtains in *Tropisternus*. In both species the pubescent area at the base of the hind femur is quite small.

1. *Pleurhomus sahlbergi*, n. s.

Ovalis, convexus, posterius attenuatus, pernitidus, supra fusco-æneus, antennis, palpis pedibusque anterioribus testaceis, pedibus posterioribus piceis; elytris sparsim punctatis. Long. 6½ mm., lat. 3½ mm.

Brazil.

The punctuation of the upper surface in this species is quite distinct, but is rather more sparing than usual, especially on the wing-cases, where, too, the punctures are not all of one size, there being distinctly larger punctures scattered amongst the finer ones. The systematic punctures on the side of the thorax form a short line, and the epipleural margin is without the least trace of sculpture or spines. The sternal spine is short, flat, and punctate, and there is not the least trace of any carina on the last ventral segment. The hind legs are very slender, the upper-inner face of their tibiæ is extremely polished and without any trace of ciliation.

I have a single individual of this remarkable little species sent to me by Prof. Sahlberg, of Helsingfors, as No. 2881; it was discovered by his father at Santa Rita, in Brazil, in September, 1850.

2. *Tropisternus obscurus*, Sharp.

Sharp, Biol. Cent. Am., i., pt. 2, p. 60, pl. ii., f. 7.

Guatemala.

In this species the punctuation of the upper surface is very fine, and is evenly distributed, except that it is denser on the head and thorax than it is on the wing-cases; the systematic punctures on the side of the

prothorax form a slightly irregular line; the epipleural margin is entirely without sculpture or spines; the swimming-legs are moderately stout, and their tibiæ possess a series of swimming-hairs parallel with their upper edge; the sternal spine is of moderate length and not flattened; the apical ventral segment bears a setigerous tubercle near the hind margin.

As regards the following species, or rather names of supposed species, I can give no information beyond the appended hints:—

Tropisternus agilis, Cast., Hist. Nat., ii., p. 53. Described from St. Vincent.—I have not seen any specimens from the island in question, but am inclined to think from Castlenau's few words of description that this may be a distinct species from any known to me.

T. binotatus, Walker, Nat. Vancouver, ii., 1866, p. 318. Vancouver's Island. — Leconte has identified this as being *H. limbalis*, Lec. (*cf.* Ann. Nat. Hist., 4 ser., vi., p. 400), so the name should pass into synonymy.

T. blandus, Chev., Ann. Soc. Ent. Fr., 1863, p. 205. Cuba.—The description of this species does not enable me to form any opinion as to whether it is valid or the name a synonym.

Hydrophilus chalybeatus, Curt., Trans. Linn. Soc., xix., p. 442. Brazil.—This is, I think, a mere synonym of *T. chalybeus*, Cast.

Tropisternus lævigatus, Boh., Eugen. Resa, p. 22. Rio de Janeiro.—I think this will prove to be a species unknown to me, unless it be a variety of *T. ovalis*, Cast.

Hydrophilus lævis, Sturm, Cat., p. 64, pl. 2, f. 13. Cayenne and Brazil.—I find it quite impossible to come to any conclusion as to what species this refers to.

H. lepidus, Brullé, Voy. d'Orb., p. 57, pl. 4, f. 4. Entre Rios.—This is clearly the same as *T. scutellaris*, Cast., and, as I believe, though of this I am not quite sure, that the latter name has priority, I have adopted it.

H. limbalis, Lec., Proc. Ac. Phil., 1855, p. 367.—Being unable to find any specific difference between North American and South American individuals, I consider this to be a synonym of *H. dorsalis*, Brullé.

H. limbatus, Brullé, Voy. d'Orb., p. 56. Brazil.—Brullé seems certainly to have described the Fabrician *H. lateralis* over again under this name, which (unless some one shall point out characters to distinguish the varieties of *H. lateralis* as distinct species) must fall into synonymy.

Tropisternus mergus, Redt., Hüg. Kasch., iv., 2, p. 514. Hindostan. — As the genus *Tropisternus* is exclusively South American, there is clearly some error in assigning this species to it, and I have therefore not occupied myself with it.

T. nitidus, Cast., Hist. Nat., ii., p. 53. Guadeloupe. —This is, I consider, a synonym of the same author's *T. chalybeus* : the dozen words of description do not indicate any distinction.

Hydrophilus quadristriatus, Horn, Trans. Am. Ent. Soc., 1871, p. 331.—This has already been recorded by its author as a synonym of *H. sublævis*, Lec.

Tropisternus sellatus, Cast., *l. c.*, p. 54.—For the present this must remain a doubtful species ; the description may possibly refer to an individual of *H. collaris*, discoloured by decay.

Hydrophilus setiger, Germ., Ins. Spec. Nov., p. 95. Buenos Ayres.—This cannot with certainty be identified from the description, which consists almost entirely of characters common to the whole of the genus. The expression " thoracis lateribus fulvis " seems to be quite exceptional, but may perhaps refer to the inflexed margin, which is yellowish or fulvescent in numerous species.

V. *On the classification of some families of the* Tineina.

By E. Meyrick, B.A.

[Read December 6th, 1882.]

Contrary to my preconceived opinion I have satisfied myself that the family classification of the Lepidoptera, as at present existing, is in the main wholly unsatisfactory. Based as it is entirely upon European types, its deficiencies only become readily apparent when it is attempted to apply the scheme to the fauna of a distinct region. One discovers then how vague and ill-defined the principal families are; the newly-added species destroy all remaining semblance of distinction, and the conclusion is inevitable, that without the aid of a system founded on well-marked and definite characters, the whole science will speedily become involved in hopeless confusion.

Two causes have principally contributed to this result, over and above the narrowness of the field of research, *viz.*, over-reliance on superficial characters, and underestimation of the value of neuration. As a striking instance of the former, take the group of the *Tortricina*, the classification of which, as at present understood in England, is scientifically quite worthless. The group presents a remarkably small range of variation in the superficial characters of form, marking, and colour, and consequently the same general appearance frequently recurs in distinct genera, and especially frequently in allied genera. Structure has consequently been disregarded in the attempt to bring together discordant species, and has even come to be more or less despised as an untrustworthy indication of affinity. Yet the group, which has been considered one of great difficulty (as indeed any group is, if classified on such principles), is really one of the easiest to arrange on a natural system. I have elsewhere (Proc. Linn. Soc. of New South Wales, 1881) given in full my views on the classification of this group, to which I need not further allude

now, except to remark that it is accurately separable into three sharply-marked families.

Neuration has probably been neglected, as being less easily observed than other characters. Yet, when one has become tolerably familiar with the principal types and deviations of structure, it can almost always be readily discerned by an examination of the under surface of the wings, where the veins usually stand out more prominently. In cases of special difficulty the wing may be rendered momentarily transparent with benzine, but the cilia are sometimes injured in this way. In the *Tortricina* and larger *Tineina* the veins can almost invariably be made out without much trouble.

The neuration forms, in my opinion, the most reliable guide to the classification of the Lepidoptera. In examining large numbers of new species I have been greatly struck by the persistence of its character in particular groups, even when the form of the wings undergoes extreme modifications. I do not mean to affirm that differences of neuration are always of importance; *Cerostoma*, Lat., and *Blabophanes*, Z., may be instanced as displaying considerable variation in this respect within genera undoubtedly natural; yet even here the variation is confined to certain limits, and *Blabophanes*, though hardly two species are identical in neuration, is yet absolutely separable from all its allies by neural characters alone. But in 450 Australian *Œcophoridæ* I found the type of neuration absolutely identical throughout, and in general I have assured myself that it affords a means of defining accurately the natural families of the *Tineina*, and probably the whole of the Lepidoptera. In the Proc. Linn. Soc. of New South Wales for this year I have pointed out how well it serves to define the natural, yet hitherto practically uncharacterised, genera of the *Crambidæ*. And in the present paper I have endeavoured to set forth the conclusions to which I have been led in the investigation of a principal group of the *Tineina*; by the result of which I desire that the principles involved may be estimated.

It should be kept in mind that, when a group has been defined by considerations of structure alone, if such a group is found to be locally distributed so as to be confined to or excluded from one or more zoological regions, the argument for its naturalness is very greatly

strengthened, and the case may in general be considered proved without special reason to the contrary. This follows immediately from the first principles of evolution.

In the following results I consider the families to be of the same value biologically as the natural orders of plants. I have been obliged to rely mainly on European and Australian species in forming the classification, since those of other regions, though partly known, have been generically too ill characterised to be available for evidence; but I have included such other exotic genera as it was possible to locate with tolerable certainty. Even Zeller's descriptions of exotic genera are commonly unrecognisable and impracticable when the neuration is not given. The neural terminology here employed is that used by von Heinemann and commonly on the Continent, the veins being denoted by numbers, counting from the inner margin to the costa.

The genera here classified are almost all included by von Heinemann in his heterogeneous family of the *Gelechiidæ*, and by Stainton in his *Gelechiidæ* and *Œcophoridæ*. Neither of these families, as understood by their authors, admits of definite characterisation, and they are therefore practically useless; and the number of species included is so enormous that, unless united by the possession of very definite characters, they would imperatively call for further subdivision. They do, however, form a connected group, standing at the head of the *Tineina*, and conforming to a single type. The essential characters of this type are:—fore wings with 12 veins, 7 and 8 stalked; hind wings with 8 veins; labial palpi recurved, pointed. The exceptions to any of these characters are very few, and are specified below in their proper place; but the characters are insufficient for definition, since they recur in combination in the *Plutellidæ*, *Hyponomeutidæ*, and *Elachistidæ*, though only occasionally. One character deserves very especial attention, *viz.*, the stalking of veins 7 and 8 of the fore wings; to this there is no exception whatever, the only appearance of one being in the two genera of *Œcophoridæ*, where these veins coincide throughout instead of partially, and in the two genera of *Gelechiidæ*, where vein 5 is absent, and therefore the stalked veins are 6 and 7 in actual order of numbering.

I propose a division of these genera into six families, as follows :—

GELECHIIDÆ.

Antennæ simple (very rarely ciliated in male). Fore wings with 12 veins (rarely 11 or 10 by obsolescence of veins 5 and 10), 7 and 8 stalked, 7 to costa (rarely to hind margin), 2 from or near angle of cell. Hind wings with 8 veins (rarely 7 by obsolescence of vein 5), 3 and 4 separate or from a point or stalked, 6 and 7 stalked or separate. Hind wings often much broader than fore wings, or sharply emarginate beneath the produced apex.

A very large family, containing in Europe about 450 species, and I have 120 from Australia and New Zealand; it appears cosmopolitan, and is everywhere largely represented, but is less conspicuous in the southern hemisphere than in the northern. The following is an attempted arrangement of the European genera, though the subdivisions given are perhaps not accurately definable :—

A. Vein 7 of fore wings to costa.

a. Veins 3 and 4 of hind wings separate.

Œcocecis, *Gn.*
Chilopselaphus, *Mn.*
*Megacraspedus, *Z.*
Mesophleps, *H-S.*
Cleodora, *Curt.*
Ceuthomadarus, *Mn.*
Anarsia, *Z.*
Psoricoptera, *Stt.*
Chelaria, *Hw.*
Parasia, *Dup.*
Rhinosia, *Tr.*
Stomopteryx, *Hein.*
Ptocheuusa, *Hein.*
*Sitotroga, *Hein.*
Apodia, *Hein.*
Recurvaria, *H-S.*
Anacampsis, *Curt.*
Argyritis, *Hein.*
Pœcilia, *Hein.*
Nannodia, *Hein.*
Lamprotes, *Hein.*
Monochroa, *Hein.*
Doryphora, *Hein.*
Ergatis, *Hein.*

b. Veins 3 and 4 of hind wings from a point or stalked.

Teleia, *Hein.*
*Lita, *Tr.*
Bryotropha, *Hein.*
Brachmia, *Hein.*
*Gelechia, *Z.*
Acanthophila, *Hein.*
Tachyptilia, *Hein.*
Brachycrossata, *Hein.*
Ceratophora, *Hein.*
Cladodes, *Hein.*

Sophronia, *Hb.*	*Ypsolophus, *F.*
Holcophora, *Stgr.*	Apiletria, *Ld.*
Nothris, *Hb.*	Lecithocera, *H-S.*

B. Vein 7 of fore wings to hind margin.

Euteles, *Hein.*	Symmoca, *Hb.*
Gonia, *Hein.*	

To this family belong also the following exotic genera, according to the characters given for them, but I cannot locate them more definitely :—

Anorthosia, *Clem.*	*Strobisia, *Clem.*
Evagora, *Clem.*	Clistothyris, *Z.*
Trypanisma, *Clem.*	Trichotaphe, *Clem.*
Enchrysa, *Z.*	Epicorthylis, *Z.*

Those genera marked (*) occur also in Australia, but of these *Sitotroga* has doubtless been introduced ; I suspect this genus to be not native even in Europe, but imported from America. I have about fifteen additional Australian genera.

CHIMABACCHIDÆ.

Antennæ ciliated in male (or rarely simple ?). Fore wings with 12 veins, 7 and 8 stalked, 7 to hind margin, 2 from rather before posterior angle of cell. Hind wings with 8 veins, 3 and 4 separate at origin, 6 and 7 separate, nearly parallel. Hind wings not or slightly broader than fore wings, hind margin rounded or slightly sinuate.

A small European group, not hitherto identified elsewhere.

Dasystoma, *Curt.*	Semioscopis, *Hb.*
Chimabacche, *Z.*	Exæretia, *Stt.*

DEPRESSARIIDÆ.

Antennæ simple. Fore wings with 12 veins, 7 and 8 stalked, 7 to costa or apex (rarely to hind margin), 2 from or near angle of cell. Hind wings with 8 veins, 3 and 4 from a point or stalked, 6 and 7 separate, nearly parallel. Hind wings not broader than fore wings, hind margin rounded.

A moderately extensive family, represented in Europe by about 110 species, nearly all belonging to *Depressaria*, which genus is little known elsewhere. From Australia and New Zealand I have only about 12 species, but the group appears to be fairly numerous in North and South America, and is said (probably correctly) to occur also in India and South Africa. The European genera are :—

Epigraphia, *Stph.*	Phibalocera, *Stph.*
Depressaria, *Hw.*	Enicostoma, *Stph.*

The following exotic genera are also referable to this family :—

Loxotoma, *Z.*	Agriocoma, *Z.*
Machimia, *Clem.*	Peleopoda, *Z.*
Psilocorsis, *Clem.*	

Of these *Loxotoma* alone occurs in Australia, where are three or four other genera ; there is also one in New Zealand.

CRYPTOLECHIIDÆ.

Antennæ ciliated in male. Fore wings with 12 veins, 7 and 8 stalked, 7 to hind margin (rarely to costa), vein 2 from before posterior fourth of lower margin of cell, widely remote from 3. Hind wings with 8 veins, 3 and 4 from a point or stalked, 6 and 7 stalked or closely approximated at base. Hind wings not broader or rather broader than fore wings, hind margin sinuate.

Extensively represented in South America, and less numerously in South Africa and Australia, but practically absent from the European region, which only possesses one species. Much confusion exists at present, owing to Zeller having included in his original genus *Cryptolechia* species not only of this family, but also of the *Œcophoridæ*, and perhaps *Depressariidæ*, which are perfectly distinct. From Australia I have about 80 species, but the family is absent from New Zealand, except one probably not indigenous species. All the Australian insects described by Zeller under *Cryptolechia*, however, belong to the *Œcophoridæ*.

The described genera certainly belonging here are—

Cryptophasa, *Lw.*	Antæotricha, *Z.*
Cryptolechia, *Z.*	

All these occur in Australia, to which region *Cryptophasa* is confined, and there are five or six new Australian genera. South America appears specially rich in this family and probably contains many additional genera.

ŒCOPHORIDÆ.

Antennæ ciliated in male. Fore wings with 12 veins (rarely 11 by coalescence of 7 and 8), 7 and 8 stalked, 7 to hind margin, apex, or costa, 2 from or near angle of cell. Hind wings with 8 veins, 3 and 4 from a point (rarely stalked), 6 and 7 separate, nearly parallel. Hind wings not broader than fore wings (very rarely slightly broader), hind margin rounded or slightly sinuate.

Rather largely represented in Europe, and extremely abundant in Australia and New Zealand, where it is the principal family of the Lepidoptera; little recorded from elsewhere, but certainly occurring in India and North and South America. The European species number about 100; from Australia and New Zealand I have 450, and the entire number inhabiting that region probably exceeds 2000.

The following is a classification of the European genera, including the only described exotic genus certainly referable :—

A. Vein 7 of fore wings to hind margin or apex.

Anchinia, *Hb.*	Aplota, *Stph.*
Cacochroa, *Hein.*	Protasis, *H-S.*
Hypercallia, *Stph.*	Topeutis, *Hb.*
*Peltophora, *Meyr.*	*Pleurota, *Hb.*
Holoscolia, *Z.*	Hypatima, *H-S.*

B. Vein 7 of fore wings to costa.

Gonionota, *Z.*	Harpella, *Schrk.*
Psecadia, *Hb.*	*Œcophora, *Z.*

To the Australian genus *Peltophora* belongs *forficella*, Sc., hitherto erroneously included in *Harpella*. The three genera marked (*) are all freely represented in Australia, whence (including New Zealand) I have characterised also 67 new genera, now being published in the Proc. Linn. Soc. of New South Wales. I have included the South American *Gonionota*, though imperfectly characterised, because it is evidently so nearly

allied to a New Zealand genus that there can be little doubt of its position.

Of the unity of this family I have no doubt; the Australian species traverse the whole range of the genera given above, and extend considerably beyond them, whilst still preserving their family characters with an extraordinary persistency.

DASYCERIDÆ.

Antennæ thickened with dense scales, ciliated in male. Fore wings with 12 veins, 7 and 8 stalked, 7 to costa, 2 from or near angle of cell. Hind wings with 8 veins, 3 and 4 from a point, 6 and 7 separate or from a point. Hind wings not broader than fore wings, hind margin rounded.

A small but peculiar family, not capable of being incorporated with any other; widely distributed, occurring in Europe, North America, India, South Africa, and Australia. Some species have the singular habit of carrying the posterior legs erect above the back, as in some genera of *Elachistidæ*, but it is certain that the similarity of habit does not here indicate affinity. About fifteen species are known altogether. The described genera are:—

Dasycera, *Hw.* Atkinsonia, *Stt.*
Eretmocera, *Z.*

Of these *Dasycera* occurs in Europe and North America, *Eretmocera* in South Africa and Australia, and *Atkinsonia* in India and Australia.

These six families constitute the group above mentioned. In connection with them may also be noticed a seventh, which, although separated from the main group by having veins 7 and 8 of the fore wings commonly separate, is yet in other respects nearly allied to them, especially to the *Œcophoridæ*.

GLYPHIPTERYGIDÆ

Antennæ simple or ciliated in male. Fore wings with 12 veins (rarely 11 by coalescence of 7 and 8), 7 and 8 separate or rarely stalked, 7 to hind margin, 2 from near angle of cell, 1 simple at base or sometimes furcate. Hind wings with 8 veins, 3 and 4 from a point, 6 and 7

separate, parallel. Hind wings not broader (rarely somewhat broader) than fore wings, hind margin rounded.

The family is universally distributed, but not very numerously represented anywhere, being apparently most plentiful in the Australian region. The following is a classification of all the genera :—

Hilarographa, *Z.*	Simaethis, *Leach.*
Choregia, *Z.*	Choreutis, *Hb.*
Hypertropha, *Meyr.*	Millieria, *Rag.*
Eupselia, *Meyr.*	Glyphipteryx, *Z.*
Æolocosma, *Meyr.*	Apistomorpha, *Meyr.*
Brenthia, *Clem.*	Phryganostola, *Meyr.*

Of the other genera included under the *Gelechiidæ* in Staudinger's Catalogue, *Carposina*, H-S., belongs to the *Conchylidæ*, as I have elsewhere pointed out. *Blastobasis*, Z., is in no way nearly related here, but belongs to the neighbourhood of the *Hyponomeutidæ*. Of *Metanarsia*, Stgr., *Pteroloncha*, Z., *Atremæa*, Stgr., *Epidola*, Stgr., and *Alloclita*, Stgr., I have not sufficient evidence to fix the position, but they probably all belong to one or other of the six families above enumerated. It will be apparent also that von Heinemann and Wocke were right in removing from this group *Butalis*, Tr., *Pancalia*, Curt., *Endrosis*, Hb., and their allies.

The following exotic genera are probably also referable to these families, but I am not able to determine their position for want of detail :—

Dysgnorima, *Z.*	Falculina, *Z.*
Auxocrossa, *Z.*	Chrysopora, *Clem.*
Mesoptycha, *Z.*	Helcystogramma, *Z.*
Mixogenes, *Z.*	Copocercia, *Z.*
Menesta, *Clem.*	Teratopsis, *Wals.*

Four other genera,—*Hermogenes*, Z., *Meridarchis*, Z., *Dasycarea*, Z., and *Ecliptoloma*, Z.,—have also been referred to the *Gelechiidæ*; but if the incomplete particulars given of their neuration are correct, they can have no true affinity here.

For the practical application of the family characters given above, it must be observed that any two families are not, as a rule, separated by the presence or absence of a single character. Most commonly they are distinguished by at least three points, to each of which rare

exceptions occur, doubtful cases being decided by majority of characters. When, however, they are distinguished by a single point (as, for example, the *Depressariidæ* and *Œcophoridæ* differ by the presence or absence of ciliations of the antennæ of the male), this character admits of no exception. It will be apparent that this is in accordance with what might be expected to result from the natural formation of families; for supposing, by variation of a particular character and extinction of intermediate forms, a new and distinct family type to be brought into being, there will be no reason whatever why the new family should not exceptionally, whether by reversion or independent variation, develop again solitary instances of the special character of its parent family. If it does this to any considerable extent the family can no longer be maintained; but if it does it in rare instances only, and at the same time continues to diverge also in other respects, it is probable that by a consideration of all points combined there will be no difficulty in detecting the true position of any particular genus, and such real or apparent reversion to any ancestral type need not be taken to vitiate the genuine distinctness of the family.

It remains to sketch the probable process of development of the group, according to this scheme of classification. The origin of the whole is to be sought in the *Œcophoridæ*, which represent the simplest type, themselves originating in the Butalid group of the *Elachistidæ* (the classification of which, whether as one or more families, need not here concern us). In accordance with this hypothesis, we find the *Œcophoridæ* at their maximum of development in the Australian region, which from its isolation has always tended to preserve such primitive forms from the disastrous competition of superior types; whilst in other regions they have been in great part (but nowhere entirely) supplanted by later developments. The *Œcophoridæ* were early divided into two natural groups (above distinguished as A and B), in the former of which vein 7 of the fore wings terminates in the hind margin or apex, and in the latter in the costa. From group B rose the *Depressariidæ*, differing by the loss of the characteristic ciliations of the antennæ, and originating from near *Pseudadia*. From the same group came also the *Dasyceridæ*, a small but ancient development from near *Œcophora*. The *Glyphipterygidæ*

would appear to be also a very ancient group, probably proceeding from group A of the *Œcophoridæ*, and reverting in some points to an older type; on which view *Eupselia* and *Æolocosma* might be regarded as approaching the primitive types of the family, and *Glyphipteryx* itself as being one of the most specialised forms. The *Chimabacchidæ* are developed immediately from the *Depressariidæ*, the characteristic change being in the separation of veins 3 and 4 of the hind wings. It is this family which gives rise to the whole group of the *Tortricina*, producing a generalised type from which the three families of the *Tortricina* rise simultaneously in diverging lines. Except the *Tortricina*, no further developments are known to have originated in any of the families of this group.

The origin of the two remaining families is not so clear as that of the others, and additional knowledge might lead me to modify my present conclusions, but I am disposed to think that the *Cryptolechiidæ* sprang from group A of the *Œcophoridæ*, preserving the characteristic ciliations of the antennæ, and the hind marginal termination of vein 7 of the fore wings, but deviating in the close approximation or coalescence at base of veins 6 and 7 of the hind wings, and the curious remoteness of vein 2 from the angle of the cell in the fore wings, the latter character analogous to what is found in two families of *Tortricina*. The *Gelechiidæ* seem to have originated from the *Depressariidæ*, diverging from them gradually in form and neuration of the hind wings, in which character they display great variability. They may be regarded as the most highly specialised family of all, the extreme of development being reached in the very narrow-winged genera with excessively emarginate hind wings; and they form, in most parts of the world, a dominant group.

On this view of the development of the group, the geographical distribution of the *Cryptolechiidæ* becomes highly interesting and important. The fact that the European region (comprising as well Northern and Western Asia and Northern Africa) is absolutely deficient in this family (for the single species, even if correctly referred here, for which I cannot vouch, can only be regarded as an exotic straggler) appears to be conclusive proof that they must have originated elsewhere; for it does not seem conceivable that a whole family, well

suited to many situations of the region, and found elsewhere flourishing in full competition with all European families, should have been ever wholly expelled from it in the struggle for existence. But it is both intelligible and likely that the same family might be unable to gain a footing from outside in the European region, stocked as it is with the most highly improved forms and protected by natural barriers. As a matter of fact the *Cryptolechiidæ* are found to be very plentiful in South America, and less plentiful, but still well represented, in South Africa and Australia. Probably they extend upwards into India and the Malay Archipelago, and perhaps also into North America, but they are absent from New Zealand. Now, assuming (what appears to me certain) that the family has never existed in Europe, the only other possible supposition is that there must have been at some period land-connection between the three southern continents. In confirmation of their southern origin, it is to be observed that the particular group, from which the *Cryptolechiidæ* appear to have been developed, is still and must always have been the prominent group in Australia. I am certainly of opinion that this case, relating to the whole of an extensive family, can be explained on no other hypothesis. It should be borne in mind that Wallace's well-known conclusions on this subject, drawn practically from the distribution of mammals and birds only, must (as I am reminded by Prof. Hutton) bear only on Tertiary and late Secondary times, and be therefore wholly inadequate to explain the distribution of so ancient a group as that of insects.

Of the other families, I believe the *Glyphipterygidæ* and *Dasyceridæ* to be very possibly of southern origin, but very early developed, and once co-extensive with the parent family *Œcophoridæ*; and the *Gelechiidæ*, *Depressariidæ*, and *Chimabacchidæ* to have been certainly developed in Europe, and thence spread over their present range.

When we consider the ancient origin, the small size, the fragility and defencelessness, the very limited specific range, and the scanty locomotive powers of the Micro-Lepidoptera, as well as their inaptitude for dissemination by extrinsic means, it appears to me that the study of their geographical distribution will be of unsurpassed value in determining the past history of the world. But before attempting this it is absolutely necessary that

their classification should be firmly established on solid principles. It is impossible to condemn too strongly the worthless character of the work done by those who create new genera at random, locate species by their superficial appearance, making a mere pretence of structural diagnosis, and frequently refer specimens of the same species to different genera, and even to different families, on account of slight differences in colour and shape of wing. It can hardly be expected that scientific investigators of the present day will acquiesce in the methods and results of writers who still continue to classify on the lines of Francis Walker. I am disposed to think that since, at the present time, a specific description is not only worthless, but also practically unidentifiable, unless accompanied by a full statement of the true generic characters, it may and should be as justly disregarded as though it were non-existent.

VI. *Notes on three* Paussi. By Louis Péringuey.

[Read February 7th, 1883.]

Paussus lineatus, Thunberg.

I first discovered *Paussus lineatus* amongst a small kind of black ant very numerous on the slopes of Table Mountain. These ants have their nests under stones; they excavate no galleries, and select those stones which are situated at the foot of a small bush. There seems to be but one class of workers; the females are 0·1 in. in length, the winged males 0·05 in.

I mostly found one *P. lineatus*, sometimes two, only once three, in the same nest. In nearly every instance it was clinging to the under side of the stone, elytra downwards. I first captured five specimens, and with them I collected a number of ants and their larvæ. I deposited them in a glass cage, where I could have a good view of them; but whether the beetles and the ants had been too much shaken in the receptacle I first put them in I cannot say, but three of the *Paussi* died two days after, and the two that were left no longer crepitated when handled, as they were wont to do when I first captured them. I then procured a new batch of ants from several nests, being under the impression that the *Paussidæ*, like the *Clavigeridæ*, were fed by ants, and I conjectured that the three that died had not been properly attended to by the ants I had enclosed with them in the glass cage. But the increase in the number of ants did not seem to affect them; they were still very torpid. On the discovery of sixteen more *P. lineatus*, I added these to my colony, having previously affixed a small bit of putty to the elytra of the first comers. The following day these two ancient individuals seemed to have recovered their energy; they both proved to be males. Altogether I enclosed twenty-one specimens in the cage, and, with the exception of the first three, all thrived well; I have twelve of them, apparently females, still alive, after sixty days of captivity.

My object was to find out if the *Paussi* were kept in

captivity by the ants for any purpose, and I do not think now that such is the case, as the following will, I hope, show.

I kept my glass cage in a rather dark room; but if I placed it in the sun the *Paussi*, which had previously been sluggish in the extreme, suddenly became very lively, perambulating the cage in the most excited manner, moving their antennæ very rapidly in a vertical line, folding and unfolding their wings, trying a clumsy flight, setting to clean themselves with their legs, and invariably seeking shelter under some bean-pods that I had put in the cage for the female ants to deposit their eggs under. Then the disc of the elytra and the antennæ would assume a most glossy appearance. Yet, whenever I placed the cage in the sun, the worker ants would set to work at once to free the larvæ. If at any time the unwieldly and (to the ants) bulky *Paussus* approached one of them, the ant, leaving off its work, would immediately seize hold of it and try to pull it in another direction; the *Paussus* would then stop, bring its antennæ forward, and stretch out its legs so as to find a better "point d'appui." Some of the other workers would come to the help of their fellow, and tug vigorously at the antennæ, always rigidly pointed forward, until the *Paussus*, feeling it could not keep its ground, would start away at a rapid pace. Then the workers would resume their work. But it often happened that the *Paussus*, in spite of the ants, made straight for the place where the larvæ and eggs were sheltered, and, finding in the pods a support that the glass surface could not afford it, it would settle in the middle of the colony in spite of the efforts of the workers; these, after a vain effort to dislodge the intruder, carried the larvæ away; the *Paussus* would then remain motionless for days in the same spot.

I thought at first that the *Paussi* were feeding on the newly-born ants, but closer and repeated observations enabled me to conclude that the workers tried to drag them away only for fear they should injure the delicate and almost transparent newly-freed individuals. I often saw the ants carry the young in their mandibles from the direction taken by a fast-walking *Paussus*. I put together six newly-born ants and two *Paussi*, and, though the jelly-like creatures did not assume a black colour and become perfectly developed until from fifteen to

thirty minutes had elapsed, the *Paussi* did not avail themselves of their helpless state to devour or injure them. I have several times repeated this experiment.

I have never seen the *Paussus* crepitate when attacked and forced to run away by the workers, but if touched at the same time with a straw or with the hand, it would give out a series of very audible explosions; its antennæ, prothorax, and elytra suddenly became covered with a yellowish substance, turning almost immediately into a yellow powder, and which is so adhesive that if the *Paussus* at that time was thrown on his back, it adhered for a short time to the glass. It would then right himself by the aid of one of its antennæ acting as a lever. These explosions leave on the fingers a stain very much like that produced by an application of lunar caustic, that will last several days in spite of repeated washings.

The beetle was always in a torpid state when I discovered it, and as soon as touched walked at a slow pace, crepitating all the while, and trusting apparently to its artillery for protection. I think that it is of crepuscular habits rather than nocturnal; for, if I examined my box at night, I always found it in its torpid state, but a short time after the appearance of the light it began to move about. However, the first *P. lineatus* I possessed was caught in the middle of a very hot day by a boy, who, feeling on his neck something that he said "stung him," seized the insect. It did not occur to me at the time to examine the spot, but I have no doubt that it was the discharge of the insect that caused the smarting pain the lad complained of.

The copulating process is rather singular. The male fixes his mandibles in the prothoracic excavation of the female, and, with his hind legs, brings the anal segment of the female towards him, apparently with great difficulty and labour; in order to strengthen himself, he has his antennæ passed under hers. I have seen males carried on the backs of females for twenty-four hours without relinquishing their hold, but as soon as placed in the sun they soon accomplished their functions and got separated from the females in a time varying between fifty-six and fifty-eight seconds. After brushing himself with his fore and hind legs the male would go in search of another female. One of my spotted males has thus fecundated no less than five females in four days.

I never saw the ants attending to the *Paussi* or seeming to draw any nourishment from them. Still, the *Paussi* seem to affect those spots where the eggs and larvæ are deposited, perhaps because they are the most sheltered places. I fed the ants with sugar and sweet biscuits. I have kept them for two months, and I still have eleven *P. lineatus* alive, although the males are apparently all dead. I never saw the females depositing their eggs, but I think they may have done so in a biscuit excavated by the ants.

That the *P. lineatus* is *not fed* by the ants, among which I always found it, seems to me to be proved by a close observation of two months' duration; still the fact remains that I have not seen it in the act of taking food. On one occasion I saw four on a piece of sweetened orange I had put as food for the ants. Now this *Paussus*, when in motion, always carries its palpi hanging at right angles, and one of those four,—the only one of whom I could get a full view,—had its palpi hanging in the usual manner, but I could not detect any sign of its jaws being in motion. I should think that Burmeister was right in calling them carnivorous insects, because with the second lot of *P. lineatus* I placed five specimens of the minute *P. Linnei*, Westw., and the day after there was but one of them left; that one was shorn of one of its antennæ, and died soon after I had removed it. The box being so well closed that the insects had no opportunity whatever of escape, I concluded that they had been devoured by the *P. lineatus*. On a second experiment, of two days' duration, three *P. Linnei* came out unscathed, except one, who lost its fore leg.

I afterwards separated five *P. lineatus* from the ants, and left them without food for eight days, but I could not detect any sign of their having suffered by their fast; they were, when exposed to the sun, as lively as those I had left with the ants.

These observations make me think that this *Paussus* is merely tolerated by the ants amongst which it is found, or perhaps kept as a pet, especially if one takes into consideration that in one case only have I found three specimens in the same nest, seldom two, and generally one only.

This species seems to have a wide range, as the Cape Town Museum has in its possession two specimens captured in the Transvaal.

Paussus Linnei, Westwood.

The habitat of this minute and very rare *Paussus* was until now only a surmise. Lacordaire thought it might come from India, and Gemminger and Harold gave its habitat as "incertæ sedis." The fact that it is so small, and that I never but once found two together, seems to account for its rarity in collections, the only one known being, I think, that which Prof. Westwood described.

I found it in the nest of an ant very common on the slopes of Table Mountain, building galleries, though not at a great depth, under stones often adjoining the nests of the kind in which I found *P. lineatus*. These ants have two sorts of workers: a worker major, more than twice the size of *P. Linnei*, with a very large head, and a very minute worker minor.

This species is very much more active than *P. lineatus*, going at a very fair pace if we consider the characteristic sluggishness of those insects. Like *P. lineatus*, it exudes the same pus-like matter, and crepitates with great vivacity without slackening its speed.

When I uncovered the nests, the major workers, sallying out in quest of the enemy, would sometimes seize hold of the *Paussus*, but they relinquished their hold immediately, and went in search of the other supposed intruder.

I did with this insect what I had done with its congener, and brought home a colony of the ants, which I placed in a large glass jar with seven *P. Linnei*.

Whether the major workers became infuriated by their captivity, I do not know, but whenever a *Paussus* passed close to the larvæ carefully heaped in a corner by the minor workers and apparently jealously watched by the major, it would be immediately set upon by one or two of the latter, the onslaught resulting in the loss to the *Paussus* of a leg, an antenna, and even once a head. In two days my specimens were mutilated or killed in that way. One male *in copulâ* was pounced upon and had his antennæ, as well as those of the female, snapped off without relinquishing his hold of her. Four other specimens that I put in the jar shared the same fate; the only unmutilated specimen remaining being one that had judiciously climbed a twig I had put in the bottle.

I had not the same chance of observing this species as I had with *P. lineatus*, yet they seemed at first to exhibit

the same habits, becoming very lively when exposed to the sun, but not attempting flight. As the ant-larvæ did not hatch before the *Paussi* were mutilated, I could not observe how the minor workers behaved towards them. They were never attacked by the major workers except when they came near the larvæ, and never used their crepitating power when thus attacked.

I have not since been able to get more specimens.

Paussus Burmeisteri, Westwood.

This *Paussus* is much more sluggish than *P. lineatus*. It crepitates when seized, exuding the same liquid, and then shams death, stiffening its antennæ to such an extent as to enable one having hold of them to move it in all directions. I never found two together, and, although I discovered it twice in the nests of the same ant as *P. Linnei*, I generally found it under stones, where there was no ant's nest within a radius of several yards.

I once captured one that was being dragged by one major and three minor workers towards a very small colony of ants; it was simply opposing its force of inertness to the efforts of its would be captors, lying on its back, with its antennæ stiffened; but as soon as I had touched it with a straw it discharged its artillery, stunning, apparently to death, the minor workers, and doubling up the major, who kept on staggering for a very long time.

Like the two above-mentioned species, when exposed to the sun, it gets lively enough, though in a lesser degree, but I never saw one expanding its wings or trying to fly.

All my specimens died soon after their capture, and I never saw any *in copulâ*.

I have not been able to detect any sign of phosphorescence in the antennæ of any of my *Paussi*, although frequently examined in the dark.

P.S.— Since the above notes were written all my *Paussus lineatus* have died, also the ants.—L. P.

VII. *Further additions to* Mr. Marshall's *Catalogue of British* Ichneumonidæ. By John B. Bridgman, F.L.S.

[Read March 7th, 1883.]

It is not without much hesitation that I have ventured to publish this paper, containing as it does the description of several insects which appear to me to be new : it is almost impossible, living in the country and being unable to spare time sufficient to stay in London long enough to hunt up all stray notes, to make oneself acquainted with all the descriptions that are written, to be certain that some of these insects may not have been previously named. I have described several species of the genus *Hemiteles*, Gr., which do not appear to be described in Gravenhorst, Ratzeburg, or Taschenberg; also some species of Ratzeburg's genus *Hemimachus*, which he split off from *Hemiteles*, and which appears to contain only some males of *Pezomachus*, and which genus has no right to a separate existence. I have also described two very distinct females of *Pezomachus*, and the male of *P. vagans*, which I bred, with the female, from a spider's nest. Mr. Bignell has also been fortunate enough to breed both sexes of *P. instabilis*, var., and *P. analis*, var.

I have again to thank the same gentlemen as last year, to whom I am indebted for much of the subject-matter of this paper; also to the Rev. T. A. Marshall.

ICHNEUMONIDÆ.

ICHNEUMONIDES OXYPYGI.

Ichneumon consimilis, Wesm.

Wesm., Tentamen, 22, 2, ♀; Ichn. Otia, 8, 3, ♂, ♀; Rem. Crit., 13.

I have taken both sexes of this Ichneumon in Norfolk. The female I have had for some years; the male I took last year at Cromer, in June. I have both the varieties of the male described by Wesmael, as well as another

which has the extreme apex of the scutellum white. The female has not the tuft of pubescence on the under side of the hind coxæ.

ICHNEUMONIDES PNEUSTICI.

Herpestomus nasutus, Wesm.

Wesm., Tent., 170, ♂, ♀; Mant., 77, ♀.

I took this species in the neighbourhood of Norwich in the autumn of 1881.

Herpestomus intermedius, Wesm.

Wesm., Tent., 171, ♀; Mant., 77, ♀.

Captured by Mr. Bignell in the neighbourhoods of Plymouth and Exeter.

Herpestomus furunculus, Wesm.?

Wesm., Tent., 171, ♀.

I have taken an *Herpestomus* which comes very near this, but differs from Wesmael's description in the legs being decidedly thinner, and not stouter than *H. intermedius*, as he says. These three species are much alike. Wesmael says (Mant., 1848, 77) that probably *intermedius* is a variety of *nasutus*; if the insects which I believe to be these species are correctly named, they certainly are distinct; the puncturing of the whole body is very different.

Phæogenes homochlorus, Wesm.

Wesm., Tent., 184, ♀.

A female of this very distinct species was taken by Mr. T. R. Billups at Chobham last year.

Æthecerus dispar, Wesm.

Wesm., Tent., 203, ♂, ♀; Mant., 90, ♂, ♀.

Mr. Bignell took a female of this species at Egloskerry, near Launceston, on July 23rd last.

Æthecerus discolor, Wesm.

Wesm., Tent., 204, ♂, ♀; Mant., 91.

I took a female of this *Æthecerus* several years ago, but, from its being fastened on a card, I did not recognise it till I reset it last year. Norwich, September, 1877.

CRYPTIDÆ.

Phygadeuon Marshalli, n. s.

Phygadeuon procerus, Gr., I. E., ii. 724, var. 2, ♂.

Segmentis 2—4 fusco- aut nigro-maculatis; femoribus tibiisque rufis, posticis apice nigris.

Head not buccated behind the eyes; mesothorax trilobed; metathorax with two irregular transverse curved lines, supero-medial area not closed at the sides; head and thorax opaque, finely and closely punctured. Abdomen cylindrical; 1st segment but little wider at the apex than at the base; spiracles placed a little behind the centre, slightly projecting, puncto-aciculate; 2nd segment about twice as long as wide, remaining ones transverse, distinctly punctated, the 2nd the most strongly so. Areolet of wings pentagonal, nervelet, sometimes a trace, sometimes absent altogether; transverse anal nervure divided below the middle; legs slender.

Black; legs red, coxæ black; middle trochanters brown-stained; basal joint of hind trochanters black, as well as the apex of hind tibiæ and tarsi; 2nd and 3rd segments of the abdomen red, with a dark transverse fuscous band before the apex, the band on the 2nd broader and transversely subdivided; 4th, 5th, and 6th segments with a narrow red margin at the apex; stigma and nervures nigro-fuscous. Male. Length, 6 mm.

There are two specimens of a male *Phygadeuon* in a collection which once belonged to the Rev. T. A. Marshall, labelled "*P. procerus*, Gr., var. 2, n. sp." They agree very well with Gravenhorst's description of this variety. Taschenberg says, in his revision of the Gravenhorstian species, that var. 2 is wanting; it differs from Taschenberg's description of the genuine *procerus* in having the areæ of the metathorax incomplete, the other having complete areæ, and the abdomen is differently coloured; whilst, according to Gravenhorst, the post-petiole is wider than in *P. Marshalli*.

Taken at Bugbrooke, near Northampton.

As I believe Mr. Marshall had not described this insect, I have taken that liberty, and have named it after him.

Hemiteles obscurus, n. s.

Niger, pedibus piceis.

Head shining, transverse; face rather protuberant in the middle; clypeus distinctly separated from the face; mandibles rather broad, teeth subequal, the space between the eyes and the mandibles about equal to the width of the clypeus; a deep semicircular impressed line above the antennæ; these latter short, flagellate, about two-thirds the length of the insect; flagellum in one specimen 15 joints, in the other 14; 1st joint more slender than the rest, about three times as long as wide; the remainder gradually decreasing in length to the last one, which is conic and about two and a half times as long as the width of the base, the four or five joints before almost of the same length, quadrate. Thorax about one-quarter longer than high, closely and distinctly punctate, opaque, trilobed, divisions deep and rather wide; scutellum rather long, keeled at the base; metathorax shining, with a few scattered rugosities; supero- and postero-medial united, somewhat of a broad coffin-shape, with the long end upwards; lateral areæ divided; lines sharply defined, terminating laterally in a short, sharp spine; 1st segment of abdomen and basal two-thirds of the 2nd somewhat transversely rugose; the remainder shining. Abdomen subovate; 1st segment stout, about two and a half times as long as the width of the apex; this twice as wide as the base; spiracles about in the middle; gradually sloping from the base to these, and then the sides not quite parallel; all the remaining segments transverse, the 3rd the widest. Legs slender. Stigma of median size and shape; areolet pentagonal, with outer nervure entirely wanting; the recurrent discoidal nervure absent, as also is the lower half of the transverse discoidal; the transverse ordinary not interstitial; the lower nervures of the hind wing very faint, transverse anal not divided.

Black; front legs ochraceo-piceous; coxæ and trochanters black, apex of latter pale; middle and hind legs, coxæ black; trochanters, base dark, apex pale; femora piceous, paler behind; tibiæ piceous, paler at the

base ; all the tarsi piceous ; stigma and nervures piceous, base of wings pale. Male. Length, 3 mm.

This insect is, in the shape of the abdomen, somewhat like *fulvipes*, but the legs are more slender, the neuration also is very different, and the 1st segment is not so broad, &c.

I bred two specimens, unfortunately both males, from the egg-bags of a spider which I found in a rolled-up nettle-leaf, protected by the spider herself; one was developed from each bag. Norwich.

Hemiteles submarginatus, n. s.

Pedibus fulvis, coxis anterioribus albis, posticis nigris ; tibiis posticis apice fuscis ; marginibus segmentorum intermediatorum rufescentibus ; mas, antennarum subtus basi albis.

Head transverse, slightly narrowed behind the eyes ; face between the eyes parallel ; space between the eyes and the mandibles about equal to the width of the base of the mandibles ; clypeus separated from the face, but not by a sharp line ; the teeth of mandibles subequal, the upper one a little the longer ; head somewhat shining, very finely and closely punctured, a shining depression over each antenna ; this latter in the female subfusiform, as in *H. fulvipes* ; 1st joint of the flagellum about three times as long as wide, the 2nd and 3rd of the same length, filiform in the male, a little shorter than the abdomen ; face pubescent. Thorax subopaque, finely reticulate, trilobed in front ; lines reaching to about the middle of the mesonotum ; metathorax rather short, with two transverse curved lines, with fine longitudinal aciculations ; lateral lines occasionally present, whereby a supero-medial area is formed, which, when present, is rounded in front and wider than behind ; the posterior face divided into three areæ. Abdomen of female elongate-ovate, male elongate ; 1st segment of abdomen about twice as wide at the apex as at the base, and about three times as long as the width of the apex, rather wider in the female than in the male ; spiracles placed behind the middle, but not prominent ; petiole with two obsolete ridges, the whole segment aciculate ; 2nd segment finely rugose at the base ; this and remaining segments of female transverse ; 2nd of male rather

longer than wide, the 3rd subquadrate, remainder transverse; styles of male not projecting; aculeus of female about one-third the length of the abdomen. Legs slender. Areolet pentagonal; exterior nervure absent; transverse anal obsoletely divided below the middle.

Black; mouth, mandibles, except the red teeth, scape beneath more or less, front coxæ almost entirely, apex of middle ones, front and middle and part of hind trochanters, pale yellow. Legs straw-coloured; middle and hinder ones more or less infuscated; hind coxæ black; incision of 2nd and 3rd segments of the male more or less stramineous; apical margin of segments of female obsoletely pale; base of wings yellow; nervures and stigma yellowish white, the former rather the darker. Length about 3 mm.

This species I have bred from *Microgaster* cocoons taken in the neighbourhood of Norwich. I have also seen a specimen bred by Mr. G. C. Bignell, which appears to me to differ only in having the spiracles of the 1st segment more prominent; it may be another species or only a local variety.

This insect at first sight looks very like small specimens of *H. fulvipes*, both in shape and colour, but differs from it in having the 1st abdominal segment much narrower; the intermediate segments are generally slightly pale at the apex; the first three joints of the flagellum of the female are longer than in *fulvipes*; and the styles of the male do not project, in *fulvipes* they are of considerable length.

Hemiteles marginatus, n. s.

Niger, segmentis intermediis abdominis margine pallido; segmentis 1 et 2 aciculatis, pedibus maximis ex parte pallidis.

Head subbuccated, behind the eyes scarcely narrowed, shining, finely punctate; antennæ about as long as the insect, filiform, in the female the apical half slightly swollen; female, 1st and 2nd joints of the flagellum about four times as long as wide, the 3rd a little shorter; male, three first joints subequal, about three times as long as wide. Mesothorax opaque, finely and densely punctate; scutellum and metathorax shining, the former with a few scattered punctures; the latter in the female

with the two transverse lines distinct, between them fine longitudinal rugæ; in the male there are scarcely any rugæ, but the lateral lines are perceptible, forming a supero-medial area, longer than broad, wider in front than behind, rounded in front; back part with the two central longitudinal lines; thorax a little longer than high; metathorax of ordinary length, back part nearly upright. Legs slender. Wings, the outer nervure of areolet wanting, or so thin as to be hardly visible, the exterior inferior angle of the discoidal cell quite beyond the corresponding angle of the areolet, no trace of nervelet, transverse ordinary interstitial, transverse anal nervure of hind wings, before the fork, divided one-third from the bottom; emitting nervure indistinct. Abdomen, 1st segment without projecting spiracles, faint indications of them in the female, gradually widening from base to apex, finely aciculate in the female, aciculations hardly visible in the male, but in the centre of the post-petiole a distinct oval pit; 2nd segment aciculate, the aciculations caused by punctures running into one another, quadrate in the male, about one-fourth wider than long in the female; the remaining segments of both sexes transverse, the 3rd segment of the female the widest; abdomen of male cylindrical from the 2nd segment; 3rd distinctly punctate, apical margins of 1 to 3 and remaining segments entirely polished, but with fine hairs, and their pits, these not dense, a slight transverse depression before the apex of the 2nd and 3rd segments; aculeus one-third the length of the abdomen.

♀. Scape of antennæ beneath, and a distinct fine line on apical margin of all the abdominal segments, except the 1st, pale straw-colour; legs pale fulvous; front and middle coxæ, and all the trochanters, yellow; front and middle tarsi dark at the apex; intermediate knees and apex of tibiæ brownish; hind legs, coxæ black, femora slightly browned above, extreme knees, apex of hind tibiæ and tarsi black-brown; tegulæ, stigma, and base of wings pale yellow, nervures brown. Male only differs from the female in having the yellow bands of the abdomen less distinct, and the abdomen more pubescent. Length, 4—5 mm.

Taken by Mr. P. Cameron.

Hemiteles politus, n. s.

Abdomine medio, basi antennarum, pedibusque rufis; apice femorum et tibiarum posticorum nigris; basi stigmate alba; aculeus dimidii abdominis longiore.

This *Hemiteles* is at first sight like *oxyphimus*, but the wings have not the fuscous band, the legs are more slender, the 1st segment of the abdomen is much narrower and polished, not aciculate, and the aculeus longer.

Shining, covered with very scattered, erect, stiff hairs, more dense on the centre of the mesothorax, which is slightly wrinkled. Head transverse, sloping behind towards the neck, sides rounded; the width behind the eyes rather less than the breadth of the eyes; face transverse, inner orbits parallel, very slightly immarginate against the antennæ; face rather protuberant in the centre; clypeus distinctly separated from the face, prominent and widely rotundate at the apex. Antennæ reaching to the middle of the 3rd abdominal segment, filiform; 1st joint of scape about as long as wide; first three joints of flagellum subequal in length, about four times as long as wide, the 4th one-third shorter, the remainder gradually tapering, the penultimate joint slightly longer than wide; flagellum 18 to 19 joints (in the three specimens two had 18 and one 19 joints). Thorax rather short, about one-fourth longer than high; mesothorax faintly trilobed in front; metathorax with distinct superior areæ; supero-medial area longer than wide; hexagonal wider behind than in front; lateral spines prominent; intermediate lines on posterior face more or less distinct; 1st segment of abdomen gradually tapering from base to apex; spiracles distinctly projecting, about three times as wide at the apex as at the base, subcanaliculated, sometimes obsoletely rugose, rather more than twice as long as the width of the apex; remaining segments transverse, the 3rd the widest, this wider than the thorax; abdomen about as long as the head and thorax; aculeus about two-thirds the length of the abdomen and straight. Legs slender. Areolet of wings pentagonal, outer nervure wanting, exterior inferior angle of discoidal cell just beyond the same angle of the areolet, transverse ordinary nervure almost interstitial, transverse discoidal divided one-third from the bottom; transverse anal slightly *post-furchal*, divided one-third from the bottom; emitting nervure distinct.

Black; three first joints of flagellum entirely, and to the middle beneath more or less red; 2nd segment of abdomen, base of 3rd, and legs, red; base of coxæ sometimes more or less fuscous; apex of hind femora and tibiæ blackish brown; extreme base of hind tibiæ brown. Wings with a slight fuscous tinge; stigma and nervure brown; base of wings and stigma white. Length 3·75—4 mm.

Three females taken in the neighbourhood of Exeter by Mr. G. C. Bignell on September 23rd, 1882. In Rev. T. A. Marshall's collection are specimens from Sandwich, Milford Haven, and Braemar.

Since the above was written I have seen another specimen taken by the Rev. W. W. Fowler; it differs from Mr. Bignell's specimens in having the abdomen not so broad, but in no other respect. Dr. Capron has also taken this variety in the neighbourhood of Shere. This species appears to be generally distributed, and is probably not uncommon.

Hemiteles subannulatus, n. s.

Abdominis medio et pedibus rufis, antennarum annulo albo, fascia alarum fusca.

Opaque, closely and finely punctate; head, seen in front, subtriangular, narrow behind the eyes; clypeus indistinctly separated from the face; a slight protuberance below the antennæ, canaliculate above; 1st and 2nd joint of flagellum of equal length, about three times as long as wide. Mesothorax trilobed; groove before the scutellum finely aciculate; metathorax long; superomedial area hexagonal, a little wider behind than in front, about twice as long as wide; costæ fine but distinct, the posterior transverse one and those on the posterior part of the metathorax very prominent; posteromedial area well defined, and, seen sideways, the posterior lateral costa appears in the form of a distinct spine; 1st abdominal segment almost gradually tapering from base to apex, slightly more than twice as long as wide, the apex nearly three times as wide as the base, apical margin distinctly trilobed; spiracles obsolete; post-petiole marked with an oval depression; abdomen elongate, ovate; 2nd and 3rd segments of equal length; the 3rd the widest, and about twice as wide as long, this rather wider than the thorax; aculeus about as long

as the 1st segment, or one-third the length of the abdomen. Legs slender. Areolet pentagonal, wider than long, recurrent nervure received before the middle, the posterior inferior angle of the discoidal cell opposite the corresponding angle of the areolet, transverse anal nervure subopposite, distinctly divided just below the middle, nervure distinct.

Black; legs, apex of 1st, 2nd to 4th segments of abdomen, pale chestnut-red; the 3rd and 4th fuscous at the sides; apex of abdomen pale; 4th to 7th joints of flagellum more or less marked with white above, nearly ringed in the middle; 1st and 2nd joints rufo-fuscous at the base; base of wings yellowish; stigma brown, apex white; nervures fuscous; a diffused fuscous cloud running across the wing, beginning about opposite the middle of the stigma. Length, 5 mm.

Taken by Dr. Capron in the neighbourhood of Shere.

Hemiteles mixtus, n. s.

Basi antennarum, pedibus, abdominisque medio, rufis; aculeo dimidio abdomine longiore.

Head and thorax smooth and shining, with scattered white pubescence; head somewhat buccated behind the eyes; apex of clypeus rounded, separated from the face. Antennæ short and stout, as in *Phygadeuon*, rather more than half the length of the insect; 1st joint of flagellum about three times as long as wide, the 2nd a little longer than wide; thorax a little longer than high; mesothorax faintly trilobed in front; upper part of metathorax shorter than the back part; areæ distinct; supero-medial area an irregular transverse hexagon, the posterior transverse line terminating laterally in a distinct spine; posterior part of metathorax with a defined postero-medial area. Abdomen smooth and shining; 1st segment elongate; sides of petiole parallel; spiracles slightly projecting from this point to apex of segment, gradually widening to about twice the width of the petiole; the segment is a little longer than the hind coxæ and trochanters; abdomen ovate, the base of the 3rd segment the widest, the 2nd and remaining segments transverse; the apical half of the abdomen with long erect hairs, very much scattered; aculeus two-thirds the length of the abdomen; legs slender. Wings, outer nervure of areolet incomplete, the exterior inferior angle

of discoidal cell opposite the middle of the areolet, the nervure straight, transverse anal divided just below the middle.

Black; mouth, mandibles, antennæ to just beyond the middle, legs, the 2nd and 3rd segments of abdomen, red; the latter brown in the middle; stigma and nervures brown; base of wing pale. ♀. Length, 3·5 mm.

Var. 1. 3rd segment of abdomen red only at the base; hind femora brownish to the middle; apical joint of all the tarsi and apex of joints of hind tarsi brown.

This insect has the antennæ of *Phygadeuon*, but the legs and wings of *Hemiteles*. I have taken one specimen at Brundall; Dr. Capron has taken one at Shere; and another, the var. 1, was taken at Tunbridge Wells early in September, 1881, by Jonkheer J. W. May.

Hemiteles ruficaudatus, n. s.

Pedibus abdominisque apice rufis.

Head, thorax, and abdomen smooth and shining, with very fine rather dense pubescence; head above transverse, scarcely slanting behind the eyes; antennæ two-thirds the length of the insect; 1st joint of flagellum about four times as long as wide, remainder gradually decreasing in length; apical joints quadrate. Thorax a little longer than high; mesothorax trilobed in front, lines distinctly impressed; metathorax short, the upper part shorter than the back part; areæ distinct, supero-medial transverse, postero-medial area defined; this again divided by a central longitudinal line; the thorax scarcely wider than the head. Abdomen fusiform; 1st segment elongate, with scarcely projecting spiracles, gradually tapering from base to apex, which is about twice the width of the base, more than three times as long as the width of the apex; post-petiole with a central groove, this sometimes extending on to the petiole; 2nd segment nearly as long as the width of the apex, which is the widest part; remainder transverse; aculeus one-fourth the length of the abdomen. Legs slender. Wings, exterior nervure of areolet wanting, or almost so; transverse anal divided one-third from the bottom.

Black; 1st joint of flagellum and greater part of the 2nd red. Legs red; apex of hind tibiæ and tarsi brown, sometimes hind knees browned. Abdomen red; 1st

segment and a bifurcate blotch at the apex of 2nd black; apex of abdomen slightly piceous; nervures and stigma dark brown; base of wings and tegulæ pale. Length, 4—5·5 mm.

Dr. Capron has taken several females of this insect in the neighbourhood of Shere, and to him I am indebted for specimens.

Hemiteles vicinus, Gr.

Gravenhorst described the female only. Pastor M. Kawall bred the male, which he recorded in Stett. Ent. Zeit., xvi., 230, but does not describe it, contenting himself with saying that it is much like *H. melanarius*, Gr.

The male in structure is very like the female, but the abdomen is not quite so wide, and is quite black. Legs black; front femora red, base black; intermediate one black, apex red; hind one entirely black; tibiæ red; apical third of hind one black; apical margin of segments smooth and shining. Taschenberg says the posterior face of the metathorax is without the intermediate lines.

Mr. Bignell bred two males and sixteen females (and from which this description is taken) on July 8th, 1882, from a pupa of *Argynnis Paphia* from the New Forest; these have the lines more or less distinct.

Hemiteles incisus, n. s.

Abdominis medio, pedibusque rufis, alis fasciis fuscis.

Head somewhat shining, with very fine, somewhat scattered, punctures. Antennæ rather more than half the length of the insect, reaching to the apex of the 2nd segment, filiform; two first joints of the flagellum subequal in length, about four times as long as wide, the remainder gradually diminishing in length, the space between the eyes slightly narrower above than below; head transverse. Thorax as wide as the head, a little longer than high; mesothorax rather wider than long, trilobed, divisions not deep, extending to the centre, lateral lobes distinctly punctured; punctures not very close; front half of middle lobe scabriculous, posterior half aciculate, interstices smooth and shiniug; scutellum smooth and shining, with a few scattered punctures;

metathorax shining, rather coarsely rugose, the two transverse lines very distinct and prominent, the lateral lines not so distinct, being confounded with longitudinal rugosities between the transverse lines; middle area an irregular hexagon twice as wide in front as behind, the boundaries of the upper lateral areæ twice as long as those of the lower lateral areæ; back part of metathorax without central lines, so that a postero-medial area is not defined, the lateral areæ terminating laterally in a subacute process. Abdomen rather longer than head and thorax; 1st segment of abdomen distinctly aciculate; basal half of the 2nd finely aciculate; remainder smooth and shining, with stiff scattered pubescence; 1st segment gradually sloping from base to apex; sides of post-petiole slightly rounding, about twice as long as the width of the apex, this about four times as wide as the base; remaining segments transverse; apex of 2nd the widest; from here gradually sloping to the apex; incisions between the segments very distinct; aculeus rather more than one-fourth the length of the abdomen. Legs moderate. Areolet of wings pentagonal; outer nervure wanting; exterior inferior angle of discoidal cell beyond the corresponding angle of areolet; transverse anal divided below the centre; nervures of front wing and stigma dark brown, the latter white at the apex; base of wing and first division of the costa pale, a dark fuscous cloud running across the wing from the stigma; 1st, 2nd, and greater part of 3rd joints of antennæ, legs, apex of 1st, 2nd to 4th segments of abdomen, red. Male. Length, 5·5 mm.

A female taken by Mr. Billups at Chobham.

Hemiteles distinctus, n. s.

Abdominis medio pedibusque rufis, segmentis primo et secundo aciculato.

Head and thorax finely reticulate; head transverse, inner orbits parallel, face transverse, cheeks not buccated, clypeus not distinctly separated from the face. Antennæ slender, rather swollen before the apex; 1st joint of flagellum about four times as long as wide, remainder gradually decreasing in length; 9th quadrate; antennæ almost as long as the body. Thorax about one-half longer than high; metathorax with the two transverse lines only moderately pubescent, slanting part with the

two central lines. Abdomen about as long and as wide as the head and thorax; 1st segment gradually tapering to the spiracles, which are situated just behind the middle and not prominent; post-petiole longer than wide, sides almost parallel, about twice as wide as the petiole, the segment two and a half times as long as the width of the apex, distinctly but finely aciculate; the 2nd rather longer than wide, faintly but decidedly aciculate, the remainder transverse; the whole abdomen with moderately scattered stiff pubescence, as is the crown of the head; aculeus about one-fourth of the abdomen. Legs slender. Areolet pentagonal; transverse ordinary nervure interstitial; transverse discoidal divided just below the middle; transverse anal subopposite, divided one-third from the bottom.

Black; legs, 2nd and 3rd segments of abdomen, pale chestnut; these latter have a little darker spot on each side; hind coxæ black-brown, apex pale; apical half of hind femora stained with fuscous; base and apex of hind tibiæ and all the tarsi the same colour. Stigma and nervures piceous; base of wings yellowish. Length, 4 mm.

One female taken by Mr. G. C. Bignell in the neighbourhood of Exeter on September 23rd, 1882.

The structure of the metathorax and sculpture of the abdomen are different from any description that I have seen.

Theroscopus niger, n. s.

Niger, pedibus rufis, coxis posticis piceis.

Head shining, with a few scattered white hairs, hardly wider than the thorax, narrow behind the eyes, seen from above somewhat globose. Antennæ shorter than the insect; 1st and 2nd joints of flagellum about equal in length, about four times as long as wide; the 5th twice as long as wide. Thorax rather longer than high; mesothorax trilobed, punctate, punctures on the middle lobe running into longitudinal aciculations; metathorax with finely divided but distinct areæ; supero-medial hexagonal, the lower lateral borders shorter than the upper ones; the posterior face without the lines defining a postero-medial area; the whole metathorax finely rugose and of normal length. Abdomen elongate-ovate, longer than the head and thorax, but not wider; 1st segment without projecting spiracles, about twice as

long as the width of the apex,—this about four times as wide as the base, aciculate, as is the basal half of the 2nd segment; remaining segments transverse, and covered with scattered pubescence; aculeus about one-half the length of the abdomen. Legs moderate. Remains of wings barely visible.

Black; the last three segments have the apical margin pale; legs brownish red; hind coxæ brown; apical half of hind femora, a ring before the base, apex of middle and hind tibiæ, and apex of tarsal joints of hinder legs, slightly fuscous. Female. Length, 4·5 mm.

One female taken by Mr. Cameron at Kingussie.

This appears to be a very distinct species, and, according to Foerster's definition, hardly belongs to this genus, it having the metathorax furnished with complete areæ. Several of his genera do not appear at all satisfactory; this species and *Aptesis hemiptera* might go into the division having the metathorax with areæ, as might also Mr. Marshall's two species; then *Aptesis hemiptera* might be a *Theroscopus* by the structure of its 1st abdominal segment. *Catalytus*, again metathorax without areæ, contains one species or variety which has the wings of *Aptesis*, and which I unfortunately was led into describing as a new species (*vide* Trans. Ent. Soc. Lond., 1882, p. 141), *Aptesis Foersteri* = *Catalytus Mangeri* = *? C. fulveolatus*, var. = *? C. longipennis*, var.

Hemimachus piceus, n. s.

Niger, pedibus maximis ex parte piceo-rufis.

Head, thorax, and 1st segment of abdomen opaque, finely reticulate; remainder of the abdomen smooth, but densely covered with fine pubescence. Head above transverse, slightly sloping behind the eyes; face longer than wide; cheeks slightly buccated; clypeus separated from the face; apex widely rotundate; mandibular teeth subequal. Antennæ rather more than three-fourths the length of the body; the first three or four joints of the flagellum subequal in length, about three times as long as wide; the 1st joint of the scape hardly so long as wide; antennæ and face pubescent. Thorax about one-third longer than high; mesothorax trilobed, the lines reaching to the middle of the disc; scutellum convex, a little higher than the mesothorax, keels only just

reaching to the base; metathorax rather long, the areæ indicated by very fine lines; supero-medial area hexagonal, longer than wide, not closed above, or rarely so; lateral areæ divided, posterior transverse line slightly defined; postero-medial area not defined. Abdomen elongate, cylindrical, not wider than the thorax, and as long as the head and thorax; the 3rd and 4th segments slightly the widest; 1st segment tapering from base to apex, varying in width at the apex from twice to three times the width of the base, the segment of normal length, the spiracles projecting, situated in the centre of the segment, a shallow groove in the middle, with faint keels not extending to the apex; 2nd segment rather longer than wide; 3rd subquadrate; the remainder transverse. Legs slender. Areolet of wings pentagonal, when the outer nervure is present longer than wide, rather narrow above; external inferior angle of the discoidal cell opposite the corresponding angle of the areolet, if not a little beyond; stigma rather short, twice as long as wide; radial cell short and deep; transverse ordinary nervure not interstitial; transverse discoidal divided nearly one-third from the bottom; transverse anal nervure of hind wing nearly straight, interrupted below the middle; emitting nervure subobsolete.

Black; legs red; front coxæ sometimes entirely red, or the base black; middle coxæ red, or more or less black; hind ones entirely black, or apex red; all the trochanters more or less marked with brown; middle femora sometimes with a fuscous stain above at the apex; hind femora with a more or less distinct fuscous line above; hind tibiæ with the apical half more or less distinctly stained with fuscous above, less so beneath, and a fuscous mark above before the base, this sometimes almost entirely absent; middle and hind tarsi fuscous, sometimes apex of front ones; mouth and under side of scape of antennæ sometimes piceous-red; stigma fuscous; nervures of front wings fuscous, hind ones pale; base of wings and tegulæ pale. Length, 4·5 mm.

These males I took by sweeping in the beginning of August, 1882, at Mousehold, near Norwich, but unfortunately took no female that might belong to the same species; they had evidently only just emerged from the pupa. I have no doubt but that they are males of one of the black *Pezomachus*, two species of which, with

the same leg-coloration, are not uncommon in the same neighbourhood.

Hemimachus hyponomeutæ, n. s.

Pedibus rufis; segmento secundo abdominis rufis, fascia media nigra.

Finely reticulate, opaque; head transverse, slanting behind the eyes; 1st joint of flagellum rather more than four times as long as wide; following joints gradually tapering to about the middle; the remaining ones subequal. Antennæ as long as the insect. Mesothorax trilobed, the lines reaching to the middle of the disc; metathorax without superior areæ, the transverse line strongly projecting without interruption; 1st segment of the abdomen gradually tapering, nearly twice as wide at the apex as at the base; spiracles very prominent; post-petiole about one and a half times as long as wide; 2nd segment about one-fourth longer than wide; remainder transverse. Abdomen about as wide as the thorax; apex of 3rd segment the widest. Legs slender. Areolet of wings pentagonal; outer nervures wanting; transverse anal nervure divided below the middle.

Scape and 1st joint of flagellum red, the former stained with brown; apical third of 1st segment of abdomen, base and apex of 2nd segment, red; the black band in the middle of this latter segment rather more than one-third the width of the segment. Legs red; apical half of hind femora slightly stained with brown, as also is apex of hind tibiæ and apical portion of the tarsal joints. Base of wings pale; nervures and stigma fuscous, the latter white at the base. Length, 5 mm.

Bred from *Hyponomeuta evonymellus* by Mr. Mosley.

This insect at first sight is very much like *Pezomachus zonatus*, but the head is narrower behind the eyes; the 1st abdominal segment, although the same shape, is stouter, and the spiracles much more prominent; the metathorax has no areæ, and the coxæ are red.

Hemimachus rufotinctus, n. s.

Prothorace, scutelli apice, abdominis medio, pedibusque castaneo-rufis, posticis coxis femoribus piceis.

Opaque, reticulate; head rather wider than the thorax,

buccated, seen from above the portion behind the eyes about equal to one-half the width of the eyes; 1st joint of flagellum the longest, about four times as long as wide, the remainder gradually decreasing in length, filiform, a little shorter than the insect. Thorax longer than high; mesothorax trilobed, the lines distinctly impressed in front; metathorax of ordinary length, sloping in a curve almost from base to apex, with indications of an elongate pentagonal supero-medial area, not closed behind; posterior transverse line only defined at the sides. Abdomen ovate, about as long as the head and thorax, and a little wider than the latter; the 1st segment is slightly longer than three times the width of the base; spiracles very prominent; post-petiole about one-fourth longer than wide, and not quite twice the width of the petiole; 2nd segment subquadrate, *i. e.*, as long as the width of the apex; remainder transverse, the 3rd and 4th the widest, and of about equal width; the apical half of the abdomen covered with pubescence, about midway between dense and very scattered. Legs slender. Wings, outer nervure of areolet wanting, recurrent nervure curved towards the apex of the wing, transverse ordinary interstitial, no nervelet, transverse anal opposite, divided one-third from the bottom, emitting nervure distinct.

Scape and base of 1st joint of flagellum partly pale chestnut-red; collar and apex of scutellum dull red; apex of 1st segment of abdomen, 2nd and 3rd, pale chestnut-red, the 2nd with a transverse fuscous stain in the middle, the 3rd with a large brownish black mark which occupies almost the entire segment. Legs pale chestnut-red; front femora behind, intermediate ones in front, with a fuscous line; hind coxæ, hind femora, except the base, fuscous; apex of middle and hind tibiæ slightly stained. Wings stained with a slightly darker band across the wing before the stigma, and another from the middle of the stigma to the apex of the wing, an irregular white line running along the recurrent discoidal nervure; both the radial nervure and stigma brown, the latter white at the base. Length, 4·5 mm.

Male taken at Felthorpe, near Norwich.

This insect, which I have little doubt is the male of one of the *Pezomachus* group, appears to me to be undescribed. In many respects it agrees very well with

H. variabilis, Ratz., but from the meagre description (Die Ichneumonen, vol. iii., p. 158) it would be impossible to say it was not that species; Hr. Brischke, in Schrift. d. natur. Gesell. in. Danzig, 1876, says that *H. variabilis*, Ratz., is the male of *Pezomachus cursitans*, Gr., and is the male of *Hemiteles palpator*, Gr., and confirms the statement in *l. c.*, 1878, p. 202, but in neither gives any description of the abdomen generally. Gravenhorst (Ich. Eur., vol. ii., p. 819) says:—"Abdomen capitis thoracisque longitudine, maris *thorace paulo angustius*, oblongum"; in *rufocinctus* it is rather wider than the thorax.

Hemimachus rufipes, n. s.

Basi antennarum, pedibus, abdominisque basi rufis.

Subopaque, densely and finely reticulate; head transverse, narrow behind the eyes; cheeks not buccated; face slightly protuberant, transverse, inner orbits parallel. Clypeus separated from the face; apex rotundate; mandibular teeth subequal. Antennæ about as long as the insect; 1st and 2nd joints of flagellum of about equal length, about four times as long as wide. Thorax nearly one-third longer than high; anterior part of mesothorax indistinctly trilobed; upper part of metathorax about as long as the back part, with two transverse curved lines, but no horizontal lines defining a supero-medial area; 1st abdominal segment rather long and slender; post-petiole one-third longer than wide; spiracles rather prominent, one-third wider than the petiole, and a little shorter than it; 2nd segment rather longer than wide; remainder transverse, the 4th segment the widest. Legs slender. Areolet inperfect; transverse anal nervure scarcely *ante-furchal*, divided about one-third from the bottom; no trace of nervelet in cubito-discoidal nervure.

Mouth, base of antennæ, and legs red; two small red spots on upper part of collar; 1st abdominal segment red, sides to middle of post-petiole stained with brown; 2nd segment entirely red; 3rd red, more or less marked with a transverse central brown band, sometimes almost obsolete; apical margin of remaining segments sometimes pale; stigma fuscous; nervures rather faint. Length, 4 mm. Male.

I have two males taken in the neighbourhood of Norwich in July.

Hemimachus ovatus, n. s.

Abdomine ovato, basi antennarum, abdomine medio pedibusque rufis.

Head, thorax, and abdomen finely and densely reticulate, opaque. Head narrow behind the eyes; face slightly protuberant, subquadrate, a little longer than wide; sides parallel; cheeks not buccated. Antennæ about as long as the body; 1st and 2nd joints of flagellum subequal, about four times as long as wide. Thorax rather longer than high; mesothorax distinctly trilobed, the depressions between the lobes extending to the scutellum; metathorax short, without areæ, the hinder transverse line only present, and that feeble; 1st abdominal segment rather short; petiole scarcely longer than the post-petiole, which is quadrate, rather more than twice as wide as the petiole; spiracles projecting and very prominent. Abdomen oblong-ovate, rather wider than the thorax, and about as long as the head and thorax; 2nd and remaining segments transverse, apex of 2nd and 3rd the widest. Legs slender. Wings clear; stigma fuscous, the imperfect areolet very small; cubito-discoidal nervure with a trace of nervelet, the transverse anal nervure *ante-furchal*, and divided one-third from the bottom.

Mouth, base of antennæ, and legs red; 1st segment of abdomen red; base and sides of petiole dark brown, a fuscous stain across the middle of the post-petiole; 2nd segment red, with a faint fuscous stain across the middle; 3rd red, with a wide brown irregular mark across the segment, nearly obliterating the red; stigma and nervures fuscous; base of wings pale. Length, 4·5 mm.

One male taken at Brundall, Sept. 15th, 1881.

Hemimachus rufocinctus.

Under the above name, in a collection that belonged to Mr. Marshall, are four male insects which do not agree either with Taschenberg's description of *Hemiteles rufocinctus*, Gr., nor to Hr. Brischke's description of *Hemimachus rufocinctus*, Ratz., which is the male of Foerster's *Pezomachus instabilis*. Taschenberg says that *H. rufocinctus*, Gr., has on the metathorax two transverse lines longitudinally wrinkled between them, but no

supero-medial area laterally defined. Hr. Brischke says that *H. rufocinctus*, Ratz., is the male of *P. instabilis*, and is different from *H. rufocinctus*, Gr., and that it has an elongated pentagonal supero-medial area on the metathorax. Mr. Marshall's insect does not belong to either of these; the metathorax is very short, has no trace of supero-medial area, and but part of one transverse line is present, and that only at the sides; the true *Hemimachus rufocinctus*, like *P. instabilis*, has the abdomen covered with scattered hairs, whilst Mr. Marshall's insect is densely covered with pubescence.

Mr. Bignell has bred two females and a male which may be a variety of *Hemimachus rufocinctus*, but they are smaller than this insect generally is; the male has only a flattened depression indicating the supero-medial area, and the female has the legs almost entirely black-brown, and not the greater part red, as is generally the case. I have seen this variety from Dr. Capron and Mr. Billups, and have taken it myself. As I have seen no insect described at all like Mr. Marshall's males, I have added a description and suggest that it should be named *H. confusus*. Dr. Capron has kindly given me a specimen of this insect.

Apex of 1st segment of abdomen, base and apex of 2nd, and base of 3rd, reddish; greater part of front legs, all the tibiæ and tarsi, reddish; stigma fuscous. Antennæ about three-fourths the length of the insect; joints of flagellum shorter than usual; 1st joint rather more than three times as long as wide; 2nd and 3rd subequal in length, rather shorter than the 1st, gradually decreasing in length, none of the joints exactly quadrate, the whole antennæ pilose; head somewhat buccated behind the eyes, a little wider than the thorax. Thorax about as long as high; mesothorax not trilobed; metathorax very short, almost inclining from base to apex, rough, no trace of supero-medial area; posterior transverse line defined only at the sides; 1st segment of abdomen elongate, tapering from base to apex; tubercles more or less distinct; post-petiole nearly one-half longer than wide. Abdomen elongate-ovate, the 3rd segment the widest, the whole abdomen covered with dense pubescence; 2nd segment nearly as long as the width of the apex; remaining ones transverse. Areolet of wings imperfect; transverse anal nervure divided one-third from the bottom. The whole insect is opaque, finely reticulate. Male. Length, 3·5—4 mm.

Hemimachus annulicornis, Marsh. MS.

? = *Pezomachus juvenilis*, Foerst., Mon. d. Gat. Pez., 136, 72, ♀.

In the 'Entomologist's Annual,' 1874, p. 127, the Rev. T. A. Marshall mentions the male and female of a small *Pezomachus*, which he took in numbers at Milford Haven. I have lately had an opportunity of examining these insects: the female I believe to be *Pezomachus juvenilis*, Foerst., an insect named and described from a single specimen, as the majority of Foerster's species were.

Mr. Bignell has taken this same species in plenty in the neighbourhood of Plymouth, and I find, although there is no variation in structure, the depth of colour and the size vary much. The length given by Foerster appears to be the minimum; in a series from Mr. Bignell now before me I find they vary from 2 mm. to nearly 4 mm. in length; in some instances the head is nearly as light coloured as the thorax, while in others it is quite dark red. The fuscous bands on the 3rd and 4th abdominal segments also vary in intensity. The male being undescribed, I have ventured to add a description of it:—

Basi abdominis, pedibus, et basi antennarum, rufis.

Antennæ long and slender, rather longer than the insect; 1st joint of flagellum about five times as long as wide, 2nd rather shorter, gradually decreasing in length, none exactly quadrate; head subglobose, much wider than the thorax. Thorax about one-third longer than high, narrow; mesothorax not trilobed; upper part of metathorax slightly longer than the back part; transverse ridge distinct, but without supero-medial area; 1st segment of abdomen somewhat elongate, gradually tapering to the region of the spiracles; from thence sides parallel; post-petiole not quite one-half longer than wide. Abdomen about as wide as the thorax; the 4th segment the widest; the 2nd one-third longer than wide; the remainder transverse. The wings vary from normal size to more or less abbreviated; the neuration towards the apex imperfect.

Head black; base of antennæ more or less red or piceous. Thorax pale piceous; 1st, 2nd, and greater

part of 3rd segment ochraceous or pale piceous-red; legs of the same colour, as well as stigma and nervures. Length, 2 mm. or a little more.

Aptesis Foersteri.

Last year I described this species as new. I now find it is only a very short-winged *Catalytus*, a genus I had not then seen. This appears to be *C. Mangeri*, Gr. Last summer I took a male with almost fully-developed wings, and have seen a female of *C. fulveolatus*, Gr., and, except the length of the wings, could detect no difference between them. It seems to me that *Catalytus* is a very weak genus; in fact there seems no distinct generic characters to separate *Catalytus*, *Aptesis*, and *Theroscopus* from one another, and they might fairly be included in one genus; perhaps *Oresbius*, Marshall, would not be much out of place if associated with them.

Pezomachus dubitator, Foerst.

In a previous paper (Trans. Ent. Soc. Lond., 1881, p. 156), under the above heading, I noticed a *Pezomachus* which I thought might be the above species. I have now but little doubt that they do not belong to this species, but are small dark varieties of *Pezomachus analis*, Foerst., having only the first two segments red, and sometimes the 2nd is deeply stained with brown. I find in almost all the species of *Pezomachus* that I have seen in any number that colour cannot be depended on for specific distinction. The one under discussion varies from having only the 1st segment of the abdomen red to those having the abdomen almost entirely red, only one or two of the apical segments being stained with brown.

Mr. Bignell has been fortunate enough to breed the dark variety, and with this three males which agree exactly with Foerster's description of *P. conveniens*, Mon. Pez., 231, 195. Of these three, two are rather darker than the description whilst the other is as described by Foerster. They were bred from *Zygæna filipendulæ*.

Pezomachus brevis, n. s.

Niger, pedibus piceis.

This species comes in Foerster's division A. II. a. yy., next to *P. pumilus*, but is much larger, and the 7th joint of the antennæ is only a little longer than broad. Foerster says the thorax is of ordinary length, with the metathorax short; in this the meso- and metathorax are of the same length, and very short; 2nd joint of flagellum a little longer than the 1st, this about two and a half times as long as broad; 5th rather longer than wide; head transverse, much wider than the thorax; meso- and metathorax of about equal length, very short; metathorax with no trace of the transverse line. Thorax much higher than long; back part of metathorax flat and slanting. Abdomen ovate; spiracles scarcely protruding; post-petiole broad; abdomen covered with scattered hairs; aculeus not quite so long as the 1st segment.

Black; scape and 1st joint of flagellum reddish brown; mouth and legs brownish red, four anterior femora towards the base rather darker; hind femora reddish brown, as is the extreme apex of hind tibiæ below; incisions of anterior segments of the abdomen slightly pale; 6th segment entirely pale. Length about 4 mm.

Taken by Mr. F. P. Pascoe at Dover.

Pezomachus hieracii, n. s.

Niger, pedibus piceis.

This *Pezomachus* belongs to Foerster's division A. I. h., and comes next to *P. tener*.

Head transverse, rather slanting behind the eyes. Antennæ moderate; 1st and 2nd joints of flagellum subequal in length, about three times as long as wide, the 5th rather longer than wide; mesothorax short; meso- and metathorax of equal length, the back part of the latter slanting and flat, without the transverse ridge; 1st segment of abdomen broad at the apex; spiracles not projecting; the remaining segments transverse; the 2nd and 3rd much shorter than usual, scarcely so deep as the width of the apex of the 1st segment, densely and uniformly covered with pubescence; aculeus a little longer than the 1st segment.

Black; base of 1st joint of flagellum pale; apex of 1st abdominal piceous; legs lighter or darker piceous; trochanters pale; apex of front and middle femora reddish; front tibiæ and tarsi reddish; base of middle tibiæ, middle and apex of hind tibiæ, and tarsi, reddish; apical joints of tarsi dark. Length, 2·75—3·5 mm.

The smaller of these was taken by Mr. Billups at Burford Bridge, Sept., 1881; the larger ones were bred by Mr. Billups and Mr. Bignell from galls of *Aulax hieracii*.

Pezomachus vagans, Oliv.

In the middle of July I bred both sexes of this *Pezomachus* from a spider's nest, and, as I believe the male is undescribed, I here give a description.

Niger, abdominis medio pedibusque rufis, femoribus et tibiis posticis piceis; alis completis.

Subopaque, finely and densely punctured; head seen above somewhat square, seen in front subrotund, rather wider than long; cheeks slightly rounded, not descending below the base of the mandibles; clypeus separated from the face, rounded at the apex, a moderate protuberance between the clypeus and the antennæ in the middle of the face, a distinctly impressed line in the centre, reaching from the antennæ to the anterior ocellus, the space between the eyes wider below than above. Antennæ slender, slightly swollen from just before the middle, a little thinner again at the apex; 1st and 2nd joints of flagellum of equal length, the 1st about four times as long as wide, all the joints longer than wide; the 7th one-third wider than the 1st; antennæ about as long as the insect. Thorax elongate, about one-third longer than high; mesothorax a regular diamond in shape, parapsides faintly defined, a well-marked depression running from the scutellum to almost the middle of the mesothorax; metathorax, seen from above the upper part is not quite so long as the width between the spiracles, without areæ, posterior transverse line strongly developed, the punctures or reticulations running transversely backward from the centre, forming wavy delicate rugosities; back part slightly sloping, with no perpendicular lines, but a distinct costa at the bottom; 1st segment of abdomen about as long or a little longer than the hind coxæ; spiracles about in the middle and rather

prominent; post-petiole but slightly wider than the petiole; the 4th segment the widest; the 2nd as long as the width of the apex; remainder transverse; the 4th and following segments with short, rather scattered, hairs. Legs slender. Wings of normal length, but narrow; stigma elongate; radial cell almost parallel; areolet pentagonal, outer nervure wanting; posterior inferior angle of discoidal cell about opposite to the corresponding angle of the areolet; cubito-discoidal nervure without a trace of nervelet; transverse discoidal divided far above the middle; transverse anal slightly geniculated below the centre, but without emitting nervure.

Black; apex of 1st abdominal segment, 2nd and 3rd, red, sides of the latter sometimes piceous. Legs rufo-testaceous; middle femora slightly piceous in the middle; hind femora nigro-piceous, base red; middle tibiæ, apex slightly piceous; hind tibiæ, apex and outside almost to the base nigro-piceous; hind tarsi and apex of front and middle ones slightly browned; base of hind coxæ sometimes the same. Wings slightly smoky; nervures and stigma brown, apex of latter white; base of wings pale. Length, 3 mm.

OPHIONIDÆ.

Anomalon perspicuum, Wesm.

Wesm., Bull. d. Belgique, xvi., 127, 7; Holm., Consp. Anom. Suec., 176, 10; Holm., Mon. Oph. Suec., 22, 11.

Mr. E. Atmore, of Lynn, bred this *Anomalon* from *Cleora lichenaria* in June last year.

Sagaritis raptor, Zett.

Porizon raptor, Zett., Ins. Lapp., 396, 4.
Sagaritis raptor, Holm., Mon. Oph. Suec., 44, 2, ♂, ♀.

I took a female *Sagaritis* at Brundall, near Norwich, in July, which agrees almost exactly with Holmgren's description of *S. raptor*; the only differences are that the supero-medial area of the metathorax is hardly transverse, the 2nd segment of the abdomen is almost entirely red, and the hind tibiæ entirely so.

Sagaritis incisa, n. s.

Niger, femoribus, tibiis tarsisque maxima ex parte rufis, post-petiolo scrobiculis tribus, segmento secundo transversim impresso; aculeo segmento primo dimidio breviore.

Face subquadrate; mandibular teeth subequal. Antennæ a little shorter than the thorax and abdomen; head transverse, narrow behind the eyes, rather wider than the thorax, with very fine white pubescence. Thorax rather longer than high, parapsides rather distinct, extending to the middle of the mesothorax; supero-medial area of metathorax subhexagonal, sometimes closed behind, sometimes not; lateral areæ imperfectly divided or not at all; postero-medial area wide, not concave. Legs moderate. Abdomen rather short and wide; post-petiole rather longer than wide; sides almost parallel, about three times as wide as the petiole and a little shorter than it; in a line with the spiracles are three very distinct pits, one in the middle and one on each side; 2nd segment a little longer than wide, with a wide obsolete transverse depression just below the base, and a very distinct deep one before the apex; 3rd and remaining segments transverse; aculeus one-half the length of the 1st segment. Wings, areolet rhomboidal, the shape of the areolet in *Mesochorus* but smaller; recurrent nervure received before the centre; transverse ordinary nervure almost interstitial; transverse anal interrupted below the middle, with scarcely a trace of nervure proceeding from it; stigma long and narrow.

Black; palpi reddish yellow; legs red; coxæ, base of front and middle trochanters, black; base and apex of hind tibiæ, towards the apex of front and middle tarsi and hind one entirely fuscous; stigma and nervures fuscous; base of wing and tegulæ yellow. Length, 5 mm.

Two females bred by Mrs. F. Norgate. The host is uncertain; the cocoon is elongate, and of uniform tawny brown.

I can find no description of a *Sagaritis* which agrees with this very marked species, and the only *Limneria* which appears to me to come near it is *C. seniculus*, Gr., I. E., iii., 473, male. This species Gravenhorst notes as having three pits on the post-petiole, just as Mrs.

Norgate's has, but the areolet is differently shaped; and Ratzeburg and Brischke have assigned a very different female to it.

Nemeritis rufipes, n. s.

Niger, pedibus rufis.

This insect comes next to *N. macrocentra*, but differs in having the legs entirely red, and the segments of the abdomen longer.

Head transverse, narrow behind the eyes. Antennæ about three-fourths the length of the insect. Thorax longer than high; metathorax with five areæ; supero-medial area longer than wide; back part of metathorax concave. Abdomen long and slender, nearly twice as long as the head and thorax; 1st segment longer than the hind coxæ and trochanters; 2nd segment nearly three times as long as wide; the 3rd not quite twice as long as wide; 4th and 5th subquadrate; 6th slightly transverse; abdomen covered with fine white pubescence; aculeus about two-thirds the length of the abdomen, very slightly curved upwards. Areolet of wings petiolated; recurrent nervure received beyond the middle; the transverse anal nervure not interrupted. Legs slender.

Black; legs red; extreme apex of tarsi fuscous; base of wings pale straw-colour; stigma pale piceous. Female. Length, 7 mm.

This very distinct species has been taken by Dr. Capron at Shere, who kindly gave me the specimen from which this description is taken.

Mesochorus pectinipes, n. s.

Niger; facie, segmentis tertii medio, pedibusque rufis, coxis posticis nigris.

Head behind the eyes subbuccated; face transverse, a little narrower above than below; mandibular teeth of equal length; clypeus distinctly separated from the face, widely rotundate, smooth, with a few scattered punctures; face distinctly and rather coarsely punctured, becoming finer and closer towards the centre; from the centre of the clypeus to the antennæ runs a distinct ridge, and from this transversely below the antennæ, slightly inclining upwards exteriorly, is another line, which together

resemble a capital T; a slight impression above each antenna; forehead smooth, with only the hair pits. Antennæ longer than the insect; 1st joint of flagellum a little longer than the 2nd and 3rd combined, which are subequal in length, and about three times as long as wide; head and thorax covered with dirty white pubescence, longer on the metathorax. Thorax longer than high; mesothorax trilobed, covered with fine, regularly scattered, punctures; apex of scutellum pointed; metathorax with distinct areæ; supero-medial area elongate, coffin-shaped; postero-medial complete, about as wide as long, curved upwards above and below. Claws of tarsi furnished with long close pectinations to the extreme apex. Abdomen longer than the head and thorax, and a little narrower; 1st segment as long or a little longer than the hind coxæ and trochanters; spiracles situated just beyond the middle, between these and the apex, the sides slightly curved inwards; sides without keels; the apex one-third wider than across the spiracles, and rather more than twice the width of the petiole; just before the apex a transverse line of faint aciculations; 2nd segment one-fourth longer than wide, the 3rd rather longer than wide, remainder transverse. Wings, transverse ordinary nervure interstitial; recurrent nervure received one-third from base of areolet; transverse anal not divided.

Mouth, face, cheeks, all the orbits, and base of antennæ, pitchy red; margin of collar, extreme apex of 2nd abdominal segment, back of 3rd, and a spot at the base of 4th, pale pitchy. Legs rufo-testaceous; hind coxæ black; extreme base and apex of hind tibiæ scarcely clouded; 5th tarsal joint and claws dark; stigma fuscous, base pale; base of wings straw-coloured. Male. Length, 6 mm.

This species, which appears to me to be undescribed, belongs to the same division of Holmgren's as *M. thoracicus*, distinguished by the tarsal claws being pectinated to the apex.

One male taken in the neighbourhood of Norwich at the beginning of May.

Mesochorus hirsutus, n. s.

Facie pedibusque flavidis, pectore, scutello, et dorso mesothoracis rufis.

Head transverse, behind the eyes narrow; teeth of mandibles of equal length; face subtransverse; head smooth and shining; 1st joint of flagellum one-third longer than the 2nd, about six times as long as wide. Thorax longer than high, finely punctate, covered with fine pubescence; metathorax with five subdistinct areæ. 1st segment of abdomen a little longer than the posterior coxæ and trochanters; petiole rather longer than the post-petiole, about one-third the width; the sides of the post-petiole almost parallel, marginated at the sides, this, as well as the rest of the abdomen, smooth and shining; 2nd and remaining segments clothed with regularly dispersed pubescence; 2nd segment slightly longer than wide; 3rd subquadrate; remainder transverse; styles shorter than usual, about one-third the length of the 1st segment. Legs moderate; claws pectinated to about the middle, pectinations not close. External radial nervure almost straight; transverse ordinary not quite interstitial; recurrent nervure received before the middle; transverse anal nervure divided below the middle. Aculeus of female about as long as the 1st segment.

♂. Black; face, cheeks, and mouth yellowish. Antennæ rufo-fuscous, palest at base of flagellum; breast and sides of mesothorax testaceous; scutellum and two streaks at base of mesothorax dull red. Legs reddish straw-colour; hind coxæ and hind femora more red; extreme apex of hind tibiæ and apical joints of all the tarsi brownish black; stigma and nervures piceous. Length, 8 mm. Male and female.

The female differs from the male only in being generally darker, the scutellum having only a trace of red, and the face black or blackish.

This fine species was taken by Dr. Capron in the neighbourhood of Shere, and to him I am indebted for a specimen. It comes in Section I. C. a. ** of Holmgren's divisions of *Mesochorus*.

Miomeris æquisgranensis, Foerst.

Uebersicht d. Gatt. u. Art. d. Fam. d. Plectiscoiden, 92, ♂, ♀.

A male of this species has been taken by Mr. E. Parfitt in the neighbourhood of Exeter.

Dicolus pectoralis, Foerst.

L. c., 97, ♂, ♀.

This species is added to our list on the strength of a female which was sent to me by the Rev. T. A. Marshall. These last two insects belong to the *Plectiscus* group, which Foerster has divided into many genera; both species are very distinct and easily recognised.

TRYPHONIDÆ.

Erromenus analis, Brischke.

Brischke, D. Ich. d. Prov. W. u. O. Preus., p. 101, ♂, ♀.

Mr. J. E. Fletcher has bred a male of this species from *Nematus crassulus*; it differs slightly from the description in having the margins of the middle segments of the abdomen not pale marked, and there is a fuscous spot above on the hind tibiæ before the base, and the hind and intermediate tarsi are brownish stained towards their apical half.

This species is very like an *Exochus*, as Hr. Brischke has remarked; the greater part of the legs are red, and the apex of the abdomen is red.

Cteniscus Dahlbomi, Holm.

Mon. Try. Suec., 242, 40, ♀.

I captured a specimen of this species at Horning Ferry, Norfolk, at the end of June. Mr. Bignell has also taken a female in the neighbourhood of Plymouth.

Exochus niger, n. s.

Niger, tibiis tarsisque rufis.

Head subquadrate, slanting behind the eyes; transverse impressions below the anterior ocellus very faint; head shining, with a few scattered punctures; meso-

thorax evenly punctured almost all over the disc; metathorax with three areæ; head, thorax, and abdomen with fine scattered white pubescence; the middle of the 2nd and 3rd abdominal segments free from the pubescence; middle of the abdomen entirely free from punctures, very smooth and shining; 2nd segment longer than wide; the 3rd subquadrate. Legs stout. Wings without areolet; transverse anal nervure divided below the centre.

Black; mouth, antennæ beneath and base of flagellum, tibiæ, tarsi, apex of front femora, and extreme apex of intermediate and hind femora, brownish red; base of wings and tegulæ the same colour, stigma and nervures black. Length, 5 mm.

This *Exochus* would come between h. and hh. of Holmgren's division B. aa. f., and differs from them in the red tibiæ.

One female taken the beginning of August, 1882, in the neighbourhood of Norwich.

Exochus pictus, Holm.

Holm., Mon. Try. Suec., 312, 9, ♂, ♀; Holm., Dip. Meth. Exoch. Scand., 66, 6, ♂, ♀.

A female of this species has been received from Mr. Cameron taken at Thornhill.

Bassus tibialis, n. s.

Niger, pedibus rufis, tibiis posticis basi albo; scutelli lateribus albo, areola nulla.

Shining; a distinct rounded projection below the antennæ; apex of clypeus truncate, the middle slightly raised, with a circular depression on each side; a distinct fovea above each antenna, with a groove between them; antennæ filiform and hairy, reaching to about the apex of the 1st segment; 1st joint of flagellum one-third longer than the 2nd, from this gradually tapering to the apical joint, which is conical; the 2nd one-third longer than wide; supero-medial area of metathorax subquadrate; back part of metathorax somewhat coarsely rugose, upper part distinctly so; 1st segment of abdomen about one-fourth longer than wide, sides almost parallel, slightly bowed, coarsely longitudinally rugose, canaliculated; base of 2nd segment the same sculpture,

with two short transverse diagonal impressions on each side at the base and towards the middle of the segment, one-third longer than wide; 3rd rather longer than wide, compressed towards the apex; remaining segments much compressed. Legs a little stouter than usual in this genus. Wings without an areolet; transverse cubital subobsolete, as in *Xylonomus*; nervelet present; transverse anal nervure divided a little below the middle.

Black; mandibles at the base, a triangular mark on clypeus, shoulders, tegulæ, sides of scutellum, base of hind tibiæ, base of 1st joint of hind tarsi, yellowish white; apex of mandibles, sides of clypeus, and legs, red; stigma piceous, extreme base pale; base of wings pale. Length, 7 mm. Female.

One specimen was given to me by Mr. F. Norgate, locality uncertain; and two have been bred by Mr. J. E. Fletcher, from pupæ of some dipteron dug up at Worcester, May 22nd, 1872.

VIII. *Remarks on a small collection of* Clavicorn Coleoptera *from Borneo, with descriptions of new species.* By A. Sidney Olliff.

[Read April 4th, 1883.]

The Clavicorns enumerated in the following list were collected by W. B. Pryer, Esq., at Sandakan, in N.E. Borneo. Although the collection contains but twenty-one species, it will, I think, be advisable to publish a complete list of them in preference to merely describing the new forms, as the Coleoptera of this locality, or indeed of any portion of Northern Borneo, are but very imperfectly known. I have added references to the descriptions of those species which are not included in the Munich Catalogue.

To receive a species of *Phylloscelis* from Borneo is interesting, as showing the very wide distribution of the genus. *P. ovides*, Mars., on which the genus was founded, was described from Senegal, *P. testudo*, Gers., from Zanzibar, and *P. arechavaletæ*, Mars., from Monte Video. I have seen a specimen of *P. testudo* in Mr. George Lewis' collection from Abyssinia.

The two new genera and more important novelties in this collection Mr. Waterhouse proposes to figure in an early number of his 'Aid to the Identification of Insects.'

I hope soon to have an opportunity of investigating the *Erotylidæ*, *Endomychidæ*, and *Coccinellidæ* contained in Mr. Pryer's collection.

List of species referred to in this paper :—

Histeridæ.

Plæsius javanus, Erich.
Phylloscelis orbicularis, n. s.

Nitidulidæ.

Calonecrus wallacei, Thoms.
,, *rufipes*, Pasc.
Carpophilus ordinatus, n. s.
Trimenus adpressus, Murr.
Prometopia rhombus, n. s.
,, *catillina*, n. s.

Trogositidæ.

Narcisa lynceus, n. s.

Acrops punctata, Fabr.
Ancyrona pryeri, n. s.
Lophocateres (n. g.) *nanus*, n. s.

COLYDIIDÆ.

Bothrideres nocturnus, Pasc.

CUCUJIDÆ.

Ancistria retusa, Fabr.
Inopeplus borneensis, n. s.
Platycotylus (n. g.) *inusitatus*, n. s.
Psammœcus hirsutus, n. s.

MYCETOPHAGIDÆ.

Litargus exiguus, n. s.

DERMESTIDÆ.

Dermestes cadaverinus, Fabr.
Trogoderma defectum, Walk.
Orphilus oscitans, n. s.

HISTERIDÆ.

PLÆSIUS, *Erichson*.

Plœsius javanus, Erich.

One example only, which is somewhat narrower than the typical form.

PHYLLOSCELIS, *Marseul*.

Phylloscelis orbicularis, n. s.

Orbicular, very convex above, a little longer than broad, shiny black. Head large, transverse, with a fine marginal stria. Antennæ pitchy, apical joint brownish yellow. Mandibles short, robust, and strongly curved, with the apex acutely bifid. Prothorax large, sides regularly rounded, anterior margin slightly produced in the middle, the lateral stria close to the margin, sparsely, irregularly, and extremely finely punctured. Scutellum scarcely visible, triangular. Elytra twice as long as the prothorax, a little broader at the base than at the apex, truncate behind, with the outer angles rounded; sides with a fine marginal stria: each elytron with six striæ; the sutural entire and rather indistinct; the others well marked, the first, second, and third parallel and entire, the fourth uniting with the sutural, the fifth commencing before the middle and extending to the apex; humeral stria very indistinct, oblique. Prosternum short, narrow, much broader in front than behind, with a strong central ridge extending from the base to just behind the apex. Mesosternum twice as broad as long; anterior margin

much produced in the centre, with a feebly defined marginal stria, and another well-marked flexuous stria extending from the posterior angle to near the middle of the anterior margin. Metasternum large, with a deeply-impressed central line, sides oblique, marginal stria distinct; near the posterior margin there are deep, scattered, rather elongate punctures. The first abdominal segment with coarse punctuation at the base. Legs pitchy, all the tibiæ armed on their outer margins with short, sharp spines, and on their inner margins with a few much smaller and sharper ones; tibial spurs short and acute. Length, 3 mm.; width, $2\frac{3}{4}$ mm.

This species is allied to *Phylloscelis ovides*, Mars., but cannot be confounded with it on account of the different structure of its mandibles and legs, smaller size, and the dissimilarity in their dorsal striæ. The strong punctuation at the base of the metasternum and on the basal segment of the abdomen is not mentioned in the description of any described species of *Phylloscelis*.

NITIDULIDÆ.

Calonecrus, *Thomson.*

Calonecrus wallacei, Thoms.

The two examples obtained, as seems almost invariably the case with this species, have a transparent yellow sticky substance adhering to them.

Calonecrus rufipes, Pascoe.

A single specimen of this rare species was obtained.

Carpophilus, *Stephens.*

Carpophilus ordinatus, n. s.

Oblong-ovate, rather convex, black, somewhat shining, sparingly clothed with fine fuscous pubescence. Head transverse, strongly and moderately closely punctured, with a feebly-defined longitudinal central impression. Eyes large, prominent, and finely granulated. Clypeus shining, impunctate. Antennæ pitchy, basal joint and club rather darker. Prothorax at the base twice as broad as long, moderately narrowed in front, where it is a little broader than the head together with the eyes, slightly convex, very coarsely and closely

punctured; anterior angles obtuse; sides gently arcuate, finely margined; posterior angles acute. Scutellum large, rounded posteriorly, more finely punctured than the prothorax. Elytra as broad as the prothorax at the base, but rather narrower at the apex, finely punctate-striate; interstices very narrow, scarcely raised; apex of each elytron strongly rounded, rather oblique on the inner side; sides with a fine reflexed margin. Abdomen with the last two segments exposed, strongly punctate, and somewhat shining above; the last segment with the sides oblique and slightly sinuate before the apex, the apex truncate, very slightly emarginate, outer angles obtuse. Under side black, feebly and rather thickly punctate. Legs pitchy, tarsi paler. Length, 3 mm.; width, $1\frac{3}{4}$ mm.

This very distinct species is best placed in Section VII. of Murray's subgenus, "*Carpophilus* proper." It is nearest to *C. bakewelli*, Murray, but has the prothorax proportionately broader, and the elytra punctate-striate and much longer than in that species.

Trimenus, *Murray*.

Trimenus adpressus, Murr.

Although a considerable number of specimens were obtained, none appear to approach *T. angustatus*, described by Mr. Murray with much hesitation as a distinct species.

Prometopia, *Erichson*.

Prometopia rhombus (Murray *in litt*).

Oblong-ovate, moderately convex above, fuscous, somewhat shining, covered with short, fine, and close greyish yellow pubescence. Head embedded in a deep emargination of the prothorax, transversely impressed, rather finely and closely punctured. Clypeus punctured as closely as the head. Eyes moderately large and coarsely granulated. Antennæ reddish brown. Prothorax at the base two and one-half times broader than long, narrowed in front, rather finely and closely punctured, deeply quadrangularly emarginate in front, finely margined, anterior angles acute and prominent, sides with a broad testaceous reflexed margin, posterior angles slightly acute. Scutellum very short and broad, rounded behind,

finely punctured. Elytra about twice as long as the prothorax, finely and irregularly punctured, sides gradually rounded, with a testaceous reflexed margin vanishing at the apex. Pygidium with only the apex visible from above. Legs reddish brown. Length, 3½ mm.; width, 2½ mm.

Can only be compared with *Prometopia binotata*, Murray, with which it agrees in outline; it is, however, at once separated from that species by its narrower head, more prominent mandibles, different colour, and more pubescent surface.

Prometopia catillina, n. s.

Oblong, a little broader in front than behind, pitchy, rather shining, sparingly clothed with very fine and short yellowish grey pubescence. Head very large, transverse, embedded in an emargination of the prothorax, impressed in front, finely and closely punctured at the base. Eyes large, rather finely granulated. Antennæ brownish testaceous. Prothorax a little more than twice as broad as long, slightly narrowed in front of the middle, very finely and closely punctured, deeply and very broadly emarginate in front, yellowish towards the sides, anterior angles acute and prominent, sides with a testaceous reflexed margin which is rather broader in front than behind, posterior angles right angles. Scutellum rounded posteriorly, more finely and closely punctured than the prothorax. Elytra more than twice as long as the prothorax, very finely and closely punctured, sides parallel for about half their length, then gradually rounded to the apex, with a testaceous reflexed margin vanishing posteriorly; each elytron with two rather large yellowish red patches, one before, the other behind the middle. Pygidium concealed. Legs brownish testaceous. Length, 3½ mm.; width, 2 mm.

This species may be distinguished by its broad head and the large size of the patches on the elytra. It evidently belongs to the group of *Prometopia quadrimaculata*, Motsch.

TROGOSITIDÆ.

NARCISA, *Pascoe.*

Narcisa lynceus, n. s.

Oblong, scarcely narrower in front than behind, dark chestnut-brown, covered with broad ashy-grey scales, intermingled here and there with blackish ones. Head embedded within an emargination of the prothorax. Eyes black, the superior pair very large, transversely ovate and approximated above. Antennæ reddish brown, club lighter. Prothorax about twice as broad as long, moderately strongly emarginate in front, the sides of the emargination very oblique, with a smooth patch on each side at the base, anterior angles rounded, posterior angles more so, sides strongly arcuate and finely serrulate. Scutellum very small, sides parallel, rounded behind. Elytra three times the length of the head and prothorax together, rather broader at the base than the prothorax, gradually widening for about two-thirds of their length, then gently rounded to the apex, crenate-striate, the alternate interstices with large deep punctures placed at irregular intervals, shoulders rectangular, sides straight, with very fine rounded serratures; each elytron with three chestnut-brown patches formed of deep punctures and scales, the first before the middle on the disc, the second on the margin a little behind the middle, the third still nearer the apex and close to the suture, the three together forming a triangle of which no two sides are equal, with an elongated oblique patch close to the apex. Under side dark brown, with a bronzy tint, rather coarsely rugulose, sparingly covered with ashy-grey scales. Meso- and metasternum less strongly rugulose. Abdominal segments very finely rugulose, thickly covered with fine ashy-grey scales. Legs bronzy, sparsely clothed with smaller scales. Length, 9 mm.; greatest width, 4 mm.

Of this interesting species, the third and largest of the genus yet described, only a single example was taken. The form of the prothorax and structure of the eyes are very peculiar. In *Narcisa decidua*, Pascoe, its nearest ally, the superior eyes are not nearly so large nor so close together; the anterior angles of the prothorax in *N. lynceus* are not so prominent nor the sides as strongly serrulate as in the other species; the

posterior angles of the prothorax are strongly rounded. The sides of the elytra are straight, whereas in *N. decidua* they are flexuous. The third species, *N. bimaculata*, Gestro (Ann. Mus. Genov., xv., p. 59), is from Sumatra, and differs, according to the description, in having only one black patch on each elytron, and the suture somewhat raised. There is no description of the eyes, but it is stated that there is a tuft of scales on the inner orbital margin of each of the superior ones: this tuft exists in both the other species, although in *N. lynceus* it is very small in comparison with that of *N. decidua*.

ACROPS, *Dalman*.

Acrops punctata, Fabr.

Appears to be common; the specimens vary from $3\frac{3}{4}$ mm. to 6 mm. in length.

ANCYRONA, *Reitter*.

Deutsche Ent. Zeitschr., xx., p. 77 (1876).

Ancyrona pryeri, n. s.

Subrotundate, a little longer than broad, much depressed, rather dark dusky brown, moderately closely covered with short, stiff, bristle-like, dirty yellow hairs, which are hooked at the extremity. Head transverse, embedded in an emargination of the prothorax. Antennæ brownish testaceous, club rather paler. Prothorax at the base more than three times as broad as long, much narrowed in front, finely and not very closely punctured, more thickly so at the sides, rather strongly emarginate in front, sides of the emargination oblique, anterior angles nearly right angles, slightly blunted, sides gently arcuate and finely margined, the margins very finely serrulate, posterior angles somewhat acute. Scutellum transverse, rounded behind. Elytra about twice as long as the head and prothorax together, crenate-striate, interstices broad, impunctate, and uneven; humeral angles slightly rounded; sides broadly dilated at the base, then gradually less and less dilated to the apex. Under side sordid testaceous. Prosternum impunctate. Abdomen with the penultimate segment rather strongly and not very closely punctured, the last segment concave,

less strongly punctured. Tibiæ and tarsi pitchy, the tips of the claws black. Length, $4\frac{1}{3}$ mm.; width, $3\frac{2}{3}$ mm.

In form this species resembles the genus *Latolæva*, Reitter (Deutsche Ent. Zeitschr. xx., p. 75), the type of which is the well-known *Peltis ovalis*, MacLeay, but in the structure of the head and prosternum it agrees best with *Ancyrona*.

LOPHOCATERES, n. g.

Head nearly quadrate. Eyes rather small, lateral, not prominent. Antennæ 11-jointed, basal joint large, with the inner angle much produced, 2nd joint short, 3rd rather longer, 4th to 7th transverse and very short, last four forming a gradually elongated club, of which the joints increase in breadth as they approach the apex. Mandibles robust, inner margin straight, the apex slightly incurved. Maxillæ with both lobes narrow and sharply jointed, the inner much the shorter. Maxillary palpi 3-jointed, the basal very small, the 2nd rather longer, the 3rd longer than the 1st and 2nd together, rounded at the apex. Labium with the anterior margin rounded. Labial palpi 2-jointed, of which the apical is somewhat the longer. Prothorax transversely quadrate, rather strongly margined laterally. Elytra about the same width as the prothorax, depressed, covering the abdomen, subparallel, with fine costæ. Legs short and slender; tibiæ armed on their outer margins with short, sharp spines, the posterior tibiæ with a row of blunt teeth at the base, slightly projecting over the 1st joint of the tarsus, tibial spurs short; tarsi 5-jointed, the basal very short, the 2nd and 3rd rather longer, the 4th shorter, and the 5th nearly as long as the other four together; claws simple.

The fine but distinct costæ on the elytra, the gradual 4-jointed club of the antennæ, and the peculiar structure of the posterior tibiæ, are characters which will serve at once to distinguish this genus. Its exact position must for the present remain doubtful, although I have no hesitation in referring it to the subfamily *Peltinæ*, and it should, I think, be placed near *Eronyxa*, Reitter (Deutsche Ent. Zeitschr., xx. (1876), p. 83), although differing widely from that genus.

Lophocateres nanus, n. s.

Elongate, pitchy brown, somewhat shining. Head finely and closely punctured at the base, rather more strongly so in front. Epistoma separated from forehead by a strongly impressed curved line. Prothorax twice as broad as long, flattened above, finely and closely punctured, slightly emarginate in front; sides reflexed, with broad and rather paler margins, posterior angles acute. Scutellum rather large, transverse, rounded posteriorly, extremely finely punctured. Elytra more than twice as long as the head and prothorax together, suture very slightly raised, sides parallel for two-thirds of their length, then gently arcuate to the apex, with narrow reflexed margins; each elytron with six fine costæ, parallel and reaching to the apex, of which the 5th is the strongest, the 6th lateral, less distinct; each costa with a line of fine distinct punctures on each side. Under side pitchy, very sparingly covered with fine yellow pubescence. Prosternum with a few scattered punctures. Mesosternum slightly rugulose. Metasternum impunctate. Antennæ and legs pitchy. Length, $3\frac{1}{2}$ mm.; width, $1\frac{1}{4}$ mm.

COLYDIIDÆ.

BOTHRIDERES, *Erichson.*

Bothrideres nocturnus, Pascoe.

Mr. Pryer obtained two examples of this rare species, in one of which the prothorax is considerably more narrowed behind than in the type, with which I have compared it. This character may possibly prove to be sexual; at any rate it is not sufficient to separate it specifically.

CUCUJIDÆ.

ANCISTRIA, *Erichson.*

Ancistria retusa, Fabr.

A single specimen only.

INOPEPLUS, *Smith.*

Inopeplus borneensis, n. s.

Black, shining. Head twice as broad as long, distinctly and closely punctured, with a well-marked longitudinal impressed mesial line in front. Antennæ with the two basal joints pitchy. Prothorax in front broader than long, strongly and obliquely narrowed behind, distinctly and rather closely punctured, anterior margin slightly produced in the centre, sides gently rounded in front. Scutellum transverse, rounded behind. Elytra piceous, with a brassy tint, as long as the head and prothorax together, at the base not quite as broad as the prothorax, much broader behind, rather coarsely and moderately closely punctured, humeral angles obtuse, sides very finely margined; apex of each elytron arcuate. Abdominal segments finely and irregularly punctured, sides regularly rounded. Legs pitchy, tarsi paler. Length, $3\frac{1}{2}$ mm.; width of abdomen, $1\frac{3}{4}$ mm.

In the form of the head and prothorax this species agrees best with *Inopeplus terminatus*, Waterh. (Ann. Mag. Nat. Hist. (5), iii., p. 214), and in the shape of the elytra and abdomen with *I. ephippiatus*, Pascoe. It is, however, at once distinguished from either of these species by its unicolorous elytra and less strongly punctured head.

PLATYCOTYLUS, n. g.

Head transverse. Eyes large, lateral, the greater portion being visible from above. Antennæ 11-jointed, flattened, gradually thickening towards the apex, basal joint short, 2nd rather shorter and narrower, 3rd a little longer than the 1st and thickening towards the apex, 4th to 7th equal in length and somewhat shorter than the 3rd, 8th to 10th shorter and rather broader, apical considerably longer and rounded at the apex. Mandibles short, robust, and simple, with the inner margin slightly sinuate before the apex. Maxillæ with the inner lobe small, narrow, and rather finely pointed; outer lobe nearly twice as long as the inner, much broader at the apex than at the base; inner margins of both lobes clothed with long bristly hairs. Maxillary palpi 4-jointed, basal joint short and narrow, 2nd much longer and broader at the apex than at the base, 3rd narrower

and but little longer than the basal, 4th nearly as long as the 2nd and pointed at the extremity. Labium small, very slightly emarginate in front, clothed with a few long hairs. Labial palpi 3-jointed, basal very small, 2nd much longer, 3rd a little longer than the 2nd, thicker at the base than at the apex. Prothorax transverse, with the anterior angles produced into sharp points, the posterior angles slightly reflexed. Scutellum transverse. Elytra depressed, subparallel, and covering the abdomen, humeral angles obtuse, slightly produced and reflexed. Legs unarmed; male with posterior tarsi 4-jointed, the other tarsi 5-jointed; claws with a small obtuse tooth in the middle.

This genus will come into the subfamily *Cucujinæ*, as defined by Erichson, and must be placed near *Læmophlœus*.

Platycotylus inusitatus, n. s.

Shining black. Head strongly and rather closely punctured. Antennæ almost half as long as the entire insect. Prothorax twice as broad as long, slightly convex, considerably narrowed behind, margined all round, very finely and moderately closely punctured; anterior margin scarcely sinuate, the angles acutely produced; sides rounded and slightly constricted before the base; posterior margin straight, with a feeble central impression, the angles slightly produced and moderately acute. Scutellum transverse, with a few fine irregular punctures. Elytra reddish brown, the suture black, the sides dusky, about twice the length of the head and prothorax together; strongly punctate-striate, the interstices slightly raised and extremely delicately punctured, moderately broad, the 4th and 5th much narrower, the 6th costiform for two-thirds of its length; with an elongate triangular impression behind the scutellum, sides very gently arcuate, rounded posteriorly. Legs pitchy black. Length, $4\frac{1}{2}$ mm.; width, $1\frac{3}{4}$ mm.

Since writing this description I have received several examples of this species from the S. Andaman Islands.

Psammœcus, *Latreille.*

Psammœcus hirsutus, n. s.

Yellowish testaceous. Head thickly covered with large and rather obscure punctuation. Antennæ about half the length of the entire insect, finely but distinctly

pubescent, with the 7th to 10th joints black. Prothorax slightly wider than the head, one-quarter broader than long, convex, closely and strongly punctured; anterior angles strongly rounded; sides subparallel, with eight fine teeth and a few long bristly hairs; posterior angles rounded. Elytra at the base considerably broader than the prothorax, gradually widening for two-thirds of their length, then arcuately narrowed to the apex, rather closely covered with fine yellow pubescence, which is thicker towards the sides, very strongly punctate-striate, the interstices raised, narrow, and smooth; each elytron with a broad lunate black marking just behind the middle, extending from the suture to near the margin. Length, $3\frac{1}{3}$ mm.; width, $1\frac{3}{4}$ mm.

Allied to *Psammœcus* (*Telephanus*) *cruciger*, Waterh. (Ent. Mo. Mag., xiii., p. 125). The feebly-toothed, subparallel, and bristly sides of the prothorax, pubescent surface, and large size of this insect are characters sufficient for its specific separation.

MYCETOPHAGIDÆ.

LITARGUS, *Erichson.*

Litargus exiguus, n. s.

Elongate-ovate, pale reddish brown, covered with very fine yellow pubescence. Head transverse, very finely and closely punctured, upper orbital margins dark brown. Prothorax as wide as the head in front, gradually widening posteriorly, convex, very closely and very finely punctured, sides gently arcuate, anterior angles obtuse, posterior slightly acute. Scutellum very small, rounded behind. Elytra twice as long as the head and prothorax together, narrowed behind, delicately and closely punctured; each elytron with three large obscure brown patches, one near the suture at the base of a triangular shape, another just before the middle at the side, the third and largest near the apex, with an indication of a fourth near the suture a little before the middle. Antennæ and legs testaceous. Length, 2 mm.; width, 1 mm.

In form this species closely resembles *Litargus trifasciatus*, Woll.; it differs, however, in being more sparingly and finely pubescent, less strongly punctured, of a darker colour, and in having six large brown patches on the elytra.

DERMESTIDÆ.

DERMESTES, *Linné.*

Dermestes cadaverinus, Fabr.

Numerous examples of this cosmopolitan species were taken.

TROGODERMA, *Latreille.*

Trogoderma defectum.

Attagenus ? defectus, Walker.

As Walker's diagnosis, "Niger, pubescens, elytris subtilissime punctatis apice ferrugineis. Long. 1 lin.," is insufficient for the identification of this species, which I have compared with his type in the National Collection, I here give a more detailed description of it :—

Ovate, pitchy black, somewhat shining, considerably broader in front than behind, densely covered with short black pubescence. Head slightly transverse, very finely and closely punctured. Prothorax much broader than long, finely and rather closely punctured on the disc, more closely at the sides, anterior angles acute, sides gently arcuate, posterior angles acute and very slightly produced ; with a stripe of yellowish grey pubescence on each side near the margin. Scutellum very small, transverse, smooth. Elytra more than twice as long as the prothorax, much narrowed behind, finely and closely punctured, ferruginous, and less closely punctured towards the apex ; the shoulders not very prominent ; the sides almost parallel for about two-thirds of their length, then gradually rounded to the apex. Under side pitchy ; the sterna polished and extremely finely punctured, pubescent at the sides ; abdominal segments very finely punctured, and clothed with very short and close pubescence. Antennæ and legs ferruginous. Length, $2\frac{1}{3}$ mm. ; width, $1\frac{1}{2}$ mm.

This species was originally described from Ceylon.

ORPHILUS, *Erichson.*

Orphilus oscitans, n. s.

Ovate, shining black, very convex, covered with rather long yellowish pubescence. Head transverse, extremely finely punctured. Antennæ short, testaceous, except the first two joints, which are dark brown ; basal joint large, transverse, 2nd very slightly shorter, 3rd to 8th very

small, 9th to 11th forming a compact club, of which the apical joint is much the largest. Prothorax much narrowed in front, very finely and closely punctured, sides rounded, posterior angles acute. Scutellum transverse, rounded behind, sparingly punctured. Elytra rather broader at the base than the prothorax, very finely, rather closely, and irregularly punctured, reddish brown, with the basal quarter black, the black extending along the suture to a little beyond the middle, with a dusky spot near the margin on each side; shoulders very slightly prominent; sides arcuate, rounded behind. Legs and tips of the claws black, tarsi testaceous. Length, 2 mm.; width, $1\frac{1}{2}$ mm.

A very distinct species. I have seen another somewhat resembling it from Chili, which is, I believe, as yet undescribed.

IX. *Descriptions of new genera and species of* Hymenoptera. By P. Cameron.

[Read April 4th, 1883.]

In this paper I have given descriptions of new species of Hymenoptera from the Sandwich Islands, Brazil, and Britain. For the Sandwich Islands species I am indebted to the Rev. Thomas Blackburn, who has done such good work in investigating the entomological fauna of these Isles. As our esteemed colleague has now left the Sandwich Islands, there is no chance of my receiving any more specimens; so I purpose, in a future paper, giving a complete catalogue of the Hymenoptera known to inhabit the Archipelago.

CHALCIDIDÆ.

Epitranus lacteipennis, n. s.

Dark reddish testaceous; the head behind, more or less of the lobes of the mesonotum, pleura, sternum, metanotum, petiole for the most part, abdomen more or less at the sides and above, coxæ and femora in the middle, blackish. Antennæ not much longer than thorax, becoming very gradually thickened towards the apex, which is sharply conical; the joints of the flagellum blackish at the apex. Head obsoletely punctured, covered with scattered silvery white short hairs; hind ocelli situated on the edge of the head behind. Thorax coarsely punctured: in the centre of the mesopleura is a shining semi-oblique line; in front of this line the pleura is obliquely striated. The scutellum is margined behind, the border shortly projecting. Metanotum reticulated, finely punctured. Petiole carinated at the side, longitudinally striated. The 2nd abdominal segment is longer than the petiole; its basal half is smooth and shining, the apical finely punctured; the posterior coxæ are not much shorter than the femora, which are somewhat alutaceous, and, with the coxæ, are covered

with short pale hairs; the femora have nine short blunt teeth, those at the apex being the shortest. Wings a very little longer than the abdomen, lacteous; nervures pallid; cubitus almost obsolete. Length, 4½ mm.

Hab. Oahu (No. 87).

Moranila, n. g.

Antennæ inserted immediately over the mouth; 2nd joint thin and very little longer than 3rd; 3rd, 4th, and 5th subequal, produced at the apices above; 6th a little shorter, being broader than long; club long, thick, longer than the three preceding joints together, apparently 2-jointed. Head broader than the thorax, broadest above, concave in front, the opposite behind. Eyes oval, situated at the sides above close to the top, and almost projecting behind; front ocellus placed a little way down, the two lateral on the edge behind; vertex without sutures; face projecting broadly between the antennæ. Pronotum broad, margined, narrower than the mesonotum. Scutellum long, longer than broad, angled in front at the sides, rounded behind, where it is much wider than at the base. Petiole longer than broad, thick; 2nd abdominal segment depressed in the centre above, much longer than all the others together; apex acute. The abdomen, with the petiole, is not much shorter than the thorax. Posterior coxæ and femora large. At the base of the abdomen, at the side, is a tuft of white hair. Wings with the ulna curved; tibiæ with only one spur.

This genus comes near to *Eunotus*, Walk. (*Megapelte*, Först.), but is sufficiently distinguished from it by the longer petiole, curved ulna, and longer prothorax (which is sharply separated from the mesothorax at the sides).

Moranila testacciceps, n. s.

Head and abdomen smooth, shining, impunctate. Thorax very finely punctured. Scutellum with a transverse line close to its apical third, behind which line it is smooth, shining, impunctate. Metanotum with scattered punctures; petiole finely and closely punctured. Head, thorax, and legs covered with white hairs. Abdomen fulvous. Scape, head, and legs testaceous; tarsi white; flagellum dull fuscous testaceous. Thorax green;

scutellum coppery behind the transverse line. Abdomen violet. Wings hyaline, a large smoky cloud in the apical half; humerus with a few scattered bristles. Length, 2 mm.

Hab. Oahu (No. 55).

Solindenia, n. g.

Antennæ 13-jointed, situated a little below the eyes; 2nd joint one-half of the length of the 3rd; 4th a little longer than 3rd; 5th and 6th subequal; 7th a little shorter; 8th a little longer than 6th; 9th a little shorter than 7th; last joint compressed strongly at the side, becoming gradually thickened. Eyes pilose, oval, converging at top, reaching to the back part of the head, beyond which they project. Ocelli in a triangle; front ridged above the antennæ. Antennal sutures not very deep. Head much broader than thorax, rather flat, longer than broad. Mesonotum margined at the side; scutellum broad at base, in front of it the mesonotum is hollow to near the middle, and the hollow is continued from there as two furrows to the pronotum. Scutellum broad, almost transverse in front; behind it becomes narrow and rounded. Metanotum hollow in the centre. Base of abdomen hollow in the centre, margined at side; 2nd segment incised at side, longer than 3rd; 4th shorter than it; last rounded, oval, much longer than preceding. Anterior femora broad at apex, flattened; middle slender; posterior stouter, narrowed at base. Middle tibiæ longer than tarsi, which are thickened, setose at base; metatarsus not much longer than the apical joint; spurs three-fourths of its length; there is only one spur on the tibia.

The hairy eyes and broad scutellum at base allies this genus to *Calosoter*, but the front ridged at the insertion of the antennæ, setose tarsi, much longer and converging eyes, readily separate it. Its nearest allies are some undescribed neo-tropical forms.

Solindenia picticornis, n. s.

Reddish testaceous, shortly pilose; head black above the insertion of the antennæ; apex of mesonotum bluish; metanotum more or less violaceous; pleura in front fuscous. Abdomen broadly white at base, the apex

testaceous; the rest fuscous-black. Legs pale testaceous; coxæ, trochanters, and tarsi white; apex of anterior tibiæ and tarsi fuscous. Scape of antennæ dull testaceous; three basal joints of flagellum and club black; the rest white. Wings shorter than the abdomen, smoky; the base more or less, an oblique mark at cubitus, and one opposite it, hyaline. Length, between 3 and 4 mm.

Hab. Oahu (No. 84).

Eupelmus flavipes, n. s.

Green; thorax beneath, the sides above more or less, and abdomen, coppery. Antennæ black; scape more or less testaceous beneath. Legs straw-yellow, the femora somewhat darker; posterior and anterior coxæ for the most part coppery green; middle pair coppery at extreme base. The antennæ are inserted a little below the level of the eyes and become but very slightly thinner towards the apex, and are covered with a microscopic pile; the 2nd joint is a little more than one-half of the length of the 3rd, which is nearly of the same length as the 4th; the 5th distinctly shorter; 6th a little shorter than 5th; the 7th, 8th, and 9th become gradually shorter; the apical a little shorter than the three preceding together, sharply pointed at the apex, and apparently composed of only one joint. The antennæ are nearly as long as the abdomen. Head and thorax covered with longish black scattered hairs. Pronotum and metanotum finely punctured. Abdomen shorter than the thorax, depressed in the centre, narrowed at base and apex, the latter rounded. Ovipositor a little longer than the posterior tarsi, testaceous, black at base and apex; apex of middle tibiæ distinctly thickened; middle metatarsus thickened, pilose beneath, shorter than the succeeding joints together; the long spur three-fourths of its length. Wings hyaline; cubitus indistinct, pallid yellow; ulna fuscous; costa scarcely pilose. Eyes large, projecting and converging towards the top. Length, 4—5 mm.

Differs from the ordinary *Eupelmi* in the eyes being more converging above, and in the antennæ not being so thick, especially towards the apex. The structure of the thorax does not differ.

Hab. Oahu (No. 57).

EVANIIDÆ.

Evania sericea, n. s.

Black ; palpi, knees, anterior tibiæ, and tarsi obscurely fuscous. Head and thorax coarsely rugose ; petiole longitudinally rugose, smoother at the base ; mesopleura in front smooth, shining, impunctate, behind coarsely reticulated ; breast covered with large shallow punctures. Coxæ finely rugose, smooth at base. Posterior femora not much longer than thorax ; tibiæ and tarsi armed with short thick bristles ; tarsi not much longer than tibiæ ; claws apparently simple. The head, thorax, and legs at the base are closely covered with a white velvety pubescence, which is longest at the sides. Abdomen smooth, shining, compressed, shortly pilose at the sides. Antennæ longer than the body ; the apex of scape brownish. Wings hyaline ; cubital and discoidal nervures obsolete from the discoidal cellules, the upper of which is not at all so broad in proportion to the lower as it is in *E. lævigata* ; the transverse humeral nervure is interstitial. The mandibles have two short obtuse teeth besides the large apical one. Length, 7 mm.

This species is apparently most nearly allied to *E. tasmanica*, Westw., but the present species has not the face longitudinally striated.

Hab. Oahu and Hawaii (No. 131).

ICHNEUMONIDÆ.

Limneria polynesialis, n. s.

Black ; tegulæ, trochanters at apex, and middle of four posterior tibiæ, yellowish white ; base and apex of four posterior tibiæ and femora reddish ; anterior legs pale testaceous, the tibiæ with a more yellowish tinge ; posterior tarsi infuscated. Abdomen on the under side at the sides, and more or less above, reddish ; segmental divisions yellowish white at the sides, and more or less above on the three apical. Head and thorax semi-opaque, finely punctured, covered (especially the face) with a white pubescence. Super-median areola distinct, semicircular ; the others are somewhat compressed ; posterior median triangular at base, and extending to the apex. Antennæ as long as the thorax and abdomen, black, obscure fuscous beneath. Terebra curved, a little

longer than the petiole, which is alutaceous. The abdomen is covered (especially the apex) with a pale pubescence. Wings hyaline; nervures and stigma pallid testaceous; areolet complete, scarcely petiolated. Length, 5 mm., with terebra.

Hab. Haleakala, Maui, at an elevation of about 4000 feet (No. 101).

Limneria blackburni, n. s.

Black; the mandibles, palpi, trochanters, knees and tibiæ (except at base and apex), and spurs, yellowish white; femora and base and apex of anterior tibiæ reddish; base of four posterior femora, base and apex of posterior tibiæ, blackish; coxæ and base of trochanters black; anterior tarsi fuscous; the base of the tarsal joints pale. Abdominal segments at junction white; ventral surface at base yellowish. Head, thorax, and coxæ almost opaque, faintly punctured, covered with a white pubescence, which is especially long on the face. Abdomen semiopaque, very finely punctured; terebra as long as the four last segments together; base of petiole smooth, almost shining. The three basal areolæ of metanotum are less strongly punctured than the rest; the superior median areola small, distinct, semicircular, broader than long; posterior median triangular at base; from that it contracts slightly, and ends about the middle of the metanotum, where there is another field longer and somewhat oval in form, which occupies the rest of the middle space; the posterior intermedian area is semiobsolete, small; spiracular, large, wider at base than at apex; at the base it becomes rounded and enlarged. Wings hyaline; areolet shortly stalked; stigma fuscous. Length, 6 mm.

Hab. Mauna Kea, Hawaii, at an elevation of at least 13,000 feet, on the snow near the summit.

The metathoracic fields are much more clearly defined in this species than usual.

Ophion lineatus.

Luteous. Eyes, claws, and sheath of ovipositor black. Wings hyaline; stigma pallid ferruginous, darker round the edges; nervures fuscous; covered with a short white pubescence. Mandibles deeply bidentate, the apex blackish; foveæ above face not very deep,

longer than broad; covered with a white pubescence. Antennæ a little longer than the body. Mesonotum almost shining, very finely punctured; mesonotum distinctly bordered all round; from the tegulæ the carina curves round to the scutellum, along the side of which it goes to the end, the two keels converging as they do so, but not joining; the apex of the mesonotum is also bordered, and there is a lateral keel at the side of the scutellum in front behind the fore wings. The metanotum is more pilose than the mesonotum; it is finely rugose all over; at the base is a waved indistinct furrow. Abdomen covered with long, depressed, white hairs, especially at the apex; the ventral surface is darker than the rest. The long spur of the posterior tibiæ is longer than the 2nd tarsal joint. Female and male. Length, 13 mm.

Hab. Hawaii, Lanai (Nos. 71 and 114).

Ophion nigricans, n. s.

Obscure black, covered all over with a close pale pubescence, the orbits of the eyes before and behind yellow; the face, more or less of mesonotum, metanotum at base, pleuræ and sternum, brownish. Mesonotum margined along the side to the end of the scutellum, which is rugose. Metanotum finely rugose; at the base is a striated furrow. Pleuræ finely punctured. Coxæ finely punctured; spurs thick, setose on under side. Antennæ somewhat shorter than the abdomen, obscure brownish fuscous. Wings hyaline; nervures fuscous; stigma livid. Length, 19 mm.

Hab. Hawaii (Nos. 129 and 130).

Nematus bridgmanii, n. s.

Black, shining, shortly pilose; labrum, clypeus, tegulæ, apex of coxæ, trochanters in part, more or less of femora, tibiæ, and tarsi, white; basal three-fourths of femora broadly lined with black, posterior almost wholly black; apex of posterior tibiæ and the tarsi faintly fuscous. Wings hyaline; costa and stigma pallid fuscous; extreme base of latter white. Antennæ a little longer than abdomen, moderately stout, tapering slightly towards apex, covered with a microscopic pile.

Vertex finely punctured, semiopaque, sutures distinct; antennal fovea large; clypeus incised at the apex. Ovipositor short, not half the length of the abdomen; sheath almost glabrous; apex acute, projecting more on upper than on lower side; tarsi shorter than tibiæ; spurs almost straight, more than one-third of the length of metatarsus.

The male has the antennæ longer and thinner, being a little shorter than the thorax and abdomen: it is almost glabrous. The stigma is fuscous, white at the base. Length, nearly $1\frac{3}{4}$ lines.

In most of the specimens the 3rd joint of the antennæ is longer than the 4th, but in one it is shorter. The 3rd cubital cellule is irregular in shape; in some specimens it is broader than long, in others slightly longer than broad. The species has the greatest resemblance to *herbaceæ*, but the darker-coloured stigma, much shorter ovipositor, more acutely-pointed sheath (which is also less hairy), and the femora more strongly marked with black at the apex, readily enables it to be distinguished from the alpine species. From *N. crassispina* it may be known by the white mouth, longer tarsi and spurs (which are almost straight), longer antennæ, and by the stigma not being unicolorous.

Mr. J. B. Bridgman bred this species from oval green galls found on sallows at Brundall, but unfortunately he did not take a description of them nor of the larvæ. No doubt this omission will be rectified during the approaching summer.

Nematus lætus, n. s.

Black; mouth and legs dirty white; the coxæ at base, posterior and middle femora almost wholly above and beneath, the anterior in the middle, the apex of posterior tibiæ and the tarsi, black; tegulæ black, the pronotum close to them dull white. Wings hyaline; nervures and stigma dark fuscous, the costa paler. The body is broad, and is covered closely with a short close pile; the head and thorax almost opaque, very finely punctured all over. The vertex is thick, and has the sutures very indistinct; the frontal area is not indicated. Clypeus almost transverse at the apex. Antennæ nearly as long as the body, covered with a microscopic pile; the 3rd joint is longer than the 4th; cenchri small. Abdomen not much longer than the head and thorax together; sheath

of saw large, projecting, covered with a dense pubescence; the extreme apex of abdomen above dirty white; cerci small; the 3rd cubital cellule is a little longer than broad; the transverse median nervure is received nearly in the middle of the cellule; the wings are large, being longer than the body. Length, $1\frac{3}{4}$ lines.

Agrees closest with *N. scoticus*, but is smaller, has the antennæ quite black, longer and thinner, the sutures on vertex less deep, the mesonotum much more strongly punctured. From the species of the *mollis* group, with punctured mesonotum (see Trans. Ent. Soc. Lond., 1882, p. 531), it may easily be known by its smaller size, fuscous black stigma, longer and thinner antennæ, shorter and blacker cerci.

Hab. Mickleham, in May (Mr. T. R. Billups).

Acropiesta? nigriceps, n. s.

Testaceous; head black; thorax darker than abdomen, covered sparingly with longish white hairs. The antennæ are as long as the thorax and abdomen; the 2nd joint is half the length of the 3rd, which is thinner than it; the 4th, 5th, and 6th are shorter and thicker than the 2nd, but thinner than the succeeding, which are broader than long, truncated at the apex, and rounded at the base; the last conical, truncated at base, and longer than the preceding. Sutures of mesonotum moderately deep, issuing from a roundish wide fovea at base of scutellum. Metathorax ending in a stout blunt spine at each side: there is a ridge in the centre which bifurcates immediately before the apex, each fork proceeding along to the side. Petiole longer than broad, of uniform thickness, as long as the metathorax: there is a slight ridge at each side. Abdomen wider and longer than the thorax; the apical half is sharply contracted to a sharp point; the 7th segment is as long as the 3rd, 4th, 5th, and 6th together. Wings narrow, not longer than the abdomen. Length, 3 mm.

This may not be an *Acropiesta*, as that genus is said to have the last antennal joint "etwas keulformig verdickt," the first eight longer than broad, the four following broader than long, and the last is as long as the two preceding, which is not the case with the species I have described. I should have placed it in *Belyta*, as defined by Förster, if that genus had not the keel cleft

in the middle instead of towards the apical third, as in *A. nigriceps*. I do not think, for my own part, that the distinction between the latter and *Belyta* is of generic value, being a mere question as to the place where the keel on the metanotum commences to bifurcate.

Hab. Gloucester, in June.

Torymus pruni, n. s.

Brilliant green; the pleuræ and coxæ with a golden iridescence; the scape beneath and mandibles reddish yellow; antennæ and ovipositor black; coxæ, four anterior femora behind, and posterior, except at extreme base and apex, green; four anterior femora in front and to some extent behind, and tibiæ, yellowish testaceous; the tarsi white, black at the apex; posterior tibiæ testaceous at extreme base and apex, the rest black; spurs white; posterior tarsi white, the three apical joints black. The head, thorax, and apex of abdomen on lower side are covered with a longish white pubescence; the legs and antennæ have a shorter and closer pubescence. The head, thorax, and coxæ are closely punctured; the abdomen is smooth and shining. The antennæ are thick; the 2nd joint is more globular than the other, but still longer than broad; the 3rd joint is longer than the 4th, which is a little longer than broad; the other joints are as broad as long, those near the apex are broader than long; the apex is slightly thickened. The head is longer than broad; the front is grooved on each side for the reception of the scape of the antennæ. The wings are clear hyaline. The ovipositor is a little shorter than the hinder tibiæ and tarsi.

The male has the scape green, the anterior femora have more green behind than the female has, the antennæ are thicker, and the apical half of the abdomen is coppery. Length, $3\frac{1}{2}$—$4\frac{1}{2}$ mm.

This species is closely allied to *T. viridis*, but the antennæ are somewhat thicker, and in the male are shorter, the hollow on the head in front is much deeper, the head and thorax are much more hairy, the hair being also longer, the ovipositor is longer, and the spurs shorter. *T. campanulæ*, Cam., agrees with it closely, but may be easily known by the ovipositor being longer than the tibiæ and tarsi.

Bred from the galls of "*Cecidomyia pruni*," Kalt.,* found in Mugdock Wood, near Milngavie, the insects emerging in August.

PARASIEROLA, n. g.

This genus agrees with *Sierola* in the structure of the humeral cellules, and especially in having a small oval cellule at their end and close to the prostigma; but it differs from it in having the radial cellule quite open, as in *Goniozus*. From the latter it may be readily known by the presence of the above-mentioned oval cellule, which is completely open on the lower side in the latter. Compared with *Sierola*, the head is more produced and narrowed in front of the antennæ, and there is a distinct carina, which is absent in the other, the keel on the metanotum being also more distinct. The wings, too, are shorter, being not much longer than the thorax.

Parasierola testaceicornis, n. s.

Black; the antennæ, knees, tibiæ, and tarsi, testaceous; the posterior tibiæ darker, almost fuscous; the apex of the antennæ blackish. Head and thorax finely shagreened, and bearing minute roundish punctures, especially on the head and mesonotum. Abdomen smooth, shining, impunctate: there is a blunt keel on the centre of the metanotum, which ends where the metathorax commences to slope; the slope is rather abrupt. Prothorax more than two-thirds of the length of the thorax; its sides are perpendicular and somewhat hollowed. The head projects beyond the antennæ into a sort of snout, and a distinct keel runs between them, this keel originating close to where the eyes end. The femora are thickened, the anterior especially; the anterior tibiæ are thicker than the others. Antennæ shorter than the thorax, stout, tapering towards the apex; the basal joint is much longer and thicker than the others; the middle joints subequal; the last is longer, a little longer than the 12th. Wings fuscous; nervures testaceous; stigma and prostigma fuscous. Length, nearly 5 mm.

Hab. Brazil.

* Die Pflanzen-feinde, p. 175; F. Loew, Verh. z.-b. G. Wien, xxv., pl. ii., fig. 3.

X. *Notes on new or little-known species of* Hymenoptera, *chiefly from New Zealand.* By W. F. Kirby, Assistant in the Zoological Department, British Museum.

[Read April 4th, 1883.]

I consider the publication of isolated descriptions, unaccompanied by figures, useful in the case of conspicuous species, or species from restricted localities which are not likely to be confounded with any others. In the present paper I describe a few new species, conformably to these simple rules, and take the opportunity to publish remarks on one or two species already known. The types are all in the British Museum.

ACULEATA.

FOSSORES.

POMPILIDÆ.

Priocnemis Huttoni.

Exp. al. 10 lin.; long. corp. 6 lin.

Black; head and thorax more or less clothed with golden yellow tomentum. Wings golden yellow; fore wings with the tips slightly clouded, and with a brown, slightly irregular, transverse band at about two-thirds of their length. Antennæ entirely black. Abdomen black; 1st segment marked with red on the sides; 2nd segment red, with a black spot on each side at the base, and two others on the back, at the hinder extremity. Legs red; coxæ, trochanters, base of front femora and extreme base of middle femora, black.

New Zealand; collected by Capt. F. W. Hutton.

Closely allied to *P. fugax*, Fabr. (*maculipennis*, Smith), but apparently distinct.

Priocnemis xenos.

Exp. al. 8 lin.; long. corp. 4 lin.

Black; face, prothorax, pleuræ, and scutellum clothed with a whitish or pale golden pubescence, brightest on the scutellum. Abdomen slightly attenuated towards the base; coxæ, trochanters, and more or less of the base of the femora, black; tips of the latter, and the tibiæ and tarsi, red; back of the two 1st segments of the abdomen slightly marked with red behind. Wings yellowish, especially towards the base.

New Zealand; collected by Capt. F. W. Hutton.

Also allied to *P. fugax*, Fabr.

Priocnemis Pascoei.

Exp. al. 10 lin.; long. corp. 6 lin.

Black; antennæ yellowish grey beneath, a slight greyish pubescence on the face and thorax. Legs, basal half of the abdomen beneath, and hind border of the 1st segment, and the whole of the 2nd segment above, rufo-testaceous; coxæ and trochanters black, except the tips of the hind trochanters; extreme tip of hind femora black above. Wings hyaline, with yellowish brown nervures and yellow stigma.

New Zealand; communicated by F. P. Pascoe, Esq.

LARRIDÆ.

Larrada Cowani.

Exp. al. 14 lin.; long. corp. 9 lin.

Black; antennæ dark red, shading into black beyond the middle; mandibles, front edge of mesothorax, and of the 1st segment of the abdomen, tegulæ, and legs, dark red; coxæ above and at the base beneath, and femora above, mostly black; face, cheeks, and scutellum, and a large spot below the hind wings, clothed with pale golden pubescence. Wings strongly clouded with yellow, and with reddish nervures; tips dusky.

Madagascar; collected by Rev. W. Deans Cowan.

Allied to *L. aurulenta*, Fabr., but rather shorter and stouter, and differing slightly in coloration. The two specimens described are not quite fresh.

CRABRONIDÆ.

TARANGA, n. g.

Apparently allied to *Pemphredon*, but more of the shape of *Priocnemis*. Head about as broad as the thorax; antennæ inserted in the middle of the face; eyes very large, reniform, and rather deeply notched just above the antennæ. Abdomen subsessile. Legs moderately stout; all the tibiæ with a pair of strong apical spurs; cubital cell rather long and narrow, not appendiculated, two complete subcubital cells, the 1st three times as long as broad, and slightly narrowed at the base, the 2nd half as long as the 1st below, but much narrower above, the 2nd transverse-cubital nervure running inwards at an acute angle, and curving slightly inwards towards its extremity; 1st recurrent nervure very oblique, curving slightly upwards towards its extremity, and received by the 1st subcubital cell at fully four-fifths of its length; the 2nd recurrent nervure forming a half-circle outwards, and received by the 2nd subcubital cell close to its base.

Taranga dubia.

Exp. al. 8 lin.; long. corp. 5 lin.

Black; head and thorax clothed with grey hair, shading into silvery on the face and cheeks, femora and tibiæ with silvery grey pubescence, and segments of the abdomen narrowly edged with the same behind. Wings hyaline, dusky towards the tips, with piceous nervures.

New Zealand; communicated by F. P. Pascoe, Esq.

PUPIVORA.

ICHNEUMONIDÆ.

PIMPLIDES.

Rhyssa semipunctata.

Exp. al. 12—18 lin.; long. corp. 6½—10 lin.; oviductus 4—7½ lin.

Red; antennæ shading into blackish beyond the middle; often entirely blackish above, except for a space of about four joints considerably before the middle; 1st four segments of the abdomen (except the base of the 1st) black; a large yellow spot on each side of the 1st segment in front, and another behind; a yellow spot on each side at the back of each of the three other black segments; ovipositor black; fore wings smoky hyaline, with black nervures, and deeply tinged with purple towards the base; hind wings clear hyaline, with black nervures; hind tarsi, except the last joint, darker than the femora and tibiæ.

Australia; New Zealand.

CHALCIDIDÆ.

TORYMINÆ.

Callimome antipoda.

Exp. al. 2 lin.; long. corp. 1¼ lin.

Greenish blue, coarsely punctured, and with golden reflections on the sides. Antennæ brown. Legs brownish yellow; upper surface of the coxæ and outside of the femora green. Wings subhyaline, with yellow nervures; cubitus brown, hook-shaped; ovipositor about as long as the abdomen.

Lindis, New Zealand. Collected by Capt. F. H. Hutton.

TEREBRANTIA.

SIRICIDÆ.

XIPHIDRIINÆ.

Derecyrta flavipes, Phil.

The female is considerably larger than the male (exp. al. ♂ 8 lin.; ♀ 13 lin.), and the legs are entirely fulvous, except the coxæ and trochanters. The hind tibiæ in both sexes are armed with one or perhaps two very slender

middle spurs, a character which allies this species to *Megalodontes*, but which I do not notice in any other *Derecyrta* or *Brachyxiphus*.

TENTHREDINIDÆ.

SELANDRIINÆ.

Cacosyndya.

Pompholyx, Freym., Protocole d'Antr. Mosc., viii., p. 217 (1870), nec Lea, 1852 (Mollusca). Type, *Pompholyx dimorpha*, Freym.

This genus is remarkable among the *Tenthredinidæ* for its having an apterous female, and I have therefore given it a name alluding to the disparity of the sexes.

EMPHYTINÆ.

Aneugmenus Thwaitesii.

Exp. al. 4 lin.; long. corp. 2 lin.

Black; antennæ 10-jointed, the joints well separated, the 2nd, 4th, and 7th of equal size, the 8th, 9th, and 10th gradually smaller and slenderer, the 3rd and 5th twice as long as the 2nd, &c., and the 4th half as long again as the 2nd. Head and abdomen punctured; thorax smooth and shining. Legs blackish brown, set with short bristles; tarsi whitish yellow; claws brown. Wings dusky hyaline, with piceous nervures, and covered with short hairs.

Ceylon; collected by the late Dr. Thwaites. The description is somewhat incomplete, owing to the specimen being carded.

XI. *Supplement to the* Geodephagous Coleoptera *of Japan, chiefly from the collection of* Mr. George Lewis, *made during his second visit, from February*, 1880, *to September*, 1881. By H. W. Bates, F.R.S., F.L.S.

[Read June 6th, 1883.]

Plates XII. and XIII.

During his second visit to Japan, in 1880 and 1881, Mr. Lewis made an extended tour through the islands, and collected industriously, with the aid of his Japanese assistants, in the central and northern parts of the main island and in the southern part of Yezo, as well as in the southern provinces, where most of his material was obtained on the former occasion. The map appended to the present paper and the itinerary at the end of these introductory remarks will enable the reader to form a better idea of the extent of his excursions through the islands than could be given by a detailed description. The result of his labours, as far as relates to the *Geodephaga*, is the discovery of 118 new species, besides the detection of a number previously known from other regions, but not from Japan, which, with a few discovered by other collectors, enable me to add 159 species* to the list of the *Geodephaga* given in my first paper, "On the Geodephagous Coleoptera of Japan," published in these Transactions for the year 1873, pp. 219—322. The following is a list of the species to be added to that given in the paper above referred to :—

CICINDELIDÆ.

Cicindela Niohozana.
,, *ovipennis.*
,, *novitia.*
,, *Niponensis.*
(= *Sumatrensis*, Herbst, var.).

CARABIDÆ.

Elaphrinæ.

Elaphrus dauricus, Mor.

Nebriinæ.

Nebria Lewisi, Bates.
,, *Sadona.*
,, *sæviens.*
,, *reflexa.*
,, *Japonica.*
,, *chalceola.*
,, *Snowi.*
,, *jamata*, Mots.
Leistus crassus.
,, *Alecto.*

* Including the "Additions to the List of Geodephagous Coleoptera of Japan," by myself, in Trans. Ent. Soc. Lond., 1876, p. 1, and a species described by Mr. Lewis in Ann. & Mag., Dec., 1879.

Leistus prolongatus.
,, *obtusicollis.*
,, *subæneus.*
Carabus telluris, Lewis.
(= *granulatus*, L., var.).
,, *Yezoensis.*
,, *Vanvolxemi*, Putz.
,, *conciliator*, Fisch.
,, *Mæander*, Fisch.
,, *aquatilis.*
,, *arboreus*, Lewis.
,, *exilis.*
,, *tenuiformis.*
,, *gracillimus.*
,, *Fujisanus.*
,, *porrecticollis.*
,, *opaculus*, Putz.
,, *Gehinii*, Fairm.
Damaster capito, Lewis.
Calosoma Chinense, Kirby.

SCARITINÆ.

Dyschirius Yezoensis.
,, *glypturus.*

BROSCINÆ.

Broscosoma elegans.

PANAGÆINÆ.

Peronomerus fumatus, Schaum.
,, *auripilis.*

CHLÆNIINÆ.

Chlænius prostenus.

HARPALINÆ.

Ophonus constrictus.
Harpalus vicarius, Har.
,, *leptopus.*
,, *chlorizans.*
,, *fuliginosus*, Dufts.
,, *flavitarsis*, Dej.
,, *variipes.*
Stenolophus connotatus.
,, *agonoïdes.*
Acupalpus marginatus, Lucas.
Tachycellus subditus, Lewis.

AMARINÆ.

Bradytus macros.
Amara Zimmermanni, Putz.
(= *chalcites*, Zim., var.).
,, *striatella*, Putz.
(= *chalcites*, Zim., var.).

PTEROSTICHINÆ.

Morio Japonicus.
Trigonognatha aurescens.
Allotriopus hoplites.
Hypherpes colonus.
Pterostichus macrogenys.
,, *pachinus.*
,, *asymmetricus.*
,, *spiculifer.*
,, *mirificus.*
,, *polygenus.*
,, *sejunctus.*
,, *defossus.*
,, *leptis.*
,, *ambigenus.*
Platysma oblongopunctata, Fab.
Lagarus nimbatidius, Chaud.
,, *dulcis.*
Pœcilus prolixus.
(= *fortipes*, Chaud. var. ?)
Stomis prognathus.

ANCHOMENINÆ.

Eucalathus colpodoïdes.
Crepidactyla melantho.
Trephionus Nikkoensis.
Anchomenus subovatus, Putz.
,, *xestus.*
,, *calleides.*
,, *sculptipes.*
,, *suavissimus.*
,, *Oguræ.*
,, *charillus.*
Colpodes Bentonis.
,, *mutator.*
,, *integratus.*
,, *astictus.*
,, *amphinomus.*
,, *limodromoïdes.*
,, *elainus.*
,, *chloreis.*
,, *Hakonus*, Har.
,, *speculator*, Har.
,, *aurelius.*
,, *rubriolus.*
Euplynes Batesi, Har.

PERIGONINÆ.

Perigona acupalpoïdes.
,, *discipennis.*
,, *sinuata.*
,, *tachyoïdes.*

POGONINÆ.

Pogonus Japonicus, Putz.

TRECHINÆ.

Trechus discus, F.
,, *oreas.*
,, *punctatostriatus*, Putz.
,, *vicarius.*

BEMBIDIINÆ.

Tachyta nana, Gyll.

Tachys scydmænoïdes, Nietn.
,, *reflexicollis.*
,, *euglyptus.*
Cillenum Yokohamæ.
Lymnæum quadri-impressum, Mots.
Bembidium varium, Ol.
,, *articulatum*, Panz.
,, *pædiscum.*
,, *Sturmii*, Panz.
,, *xanthocera.*
,, *tetraporum.*
,, *aureofuscum.*
,, *pliculatum.*
,, *lucillum.*
,, *amaurum.*
,, *Nikkoense.*
,, *elongatum*, Dej.
,, *cnemidotum.*
,, *oxyglymma.*
,, *eurygonum.*
,, *sanatum.*
,, *semiluitum.*
,, *chloreum.*
,, *misellum*, Har.
,, *leucolenum.*
,, *pogonoïdes.*
,, *æneipes.*
,, *chloropus.*
,, *striatum*, F.

HEXAGONIINÆ.
Trigonodactyla insignis.

ODACANTHINÆ.
Casnonia litura, Schmidt-Goeb.
,, *ægrota.*

DRYPTINÆ.
Drypta fulveola.
Dendrocellus geniculatus, Klug.

BRACHININÆ.
Brachinus æneicostis.

COPTODERINÆ.
Catascopus ignicinctus.
Lioptera erotyloïdes.
Coptodera Japonica.
,, *subapicalis*, Putz.
Mochtherus luctuosus, Putz.
Dolichoctis ornatellus.

DROMIINÆ.
Dromius campanulatus.
,, *breviceps.*
,, *crassipalpis.*
Blechrus glabratus, Dufts.
,, *maurus*, Sturm.
Metabletus 4-punctatus, Schmidt-Goeb.?
Demetrias marginicollis.

PHYSODERINÆ.
Lachnoderma asperum.

PENTAGONICINÆ.
Pentagonica angulosa.

LEBIINÆ.
Lebia duplex.
,, *sylvarum.*
,, *Iolanthe.*

The number of species contained in the original list was 244, but three of these (*Calosoma mikado*, *Pterostichus Japonicus*, and *P. tropidurus*), having been proved to be synonyms of others in the list, must be deducted, leaving the number 241, which, added to the 159 now added, make a total of 400.* The changes and rectifications to be made in the former list consequent on later observations, the institution of new genera and so forth, are as follow :—

Notiophilus impressifrons, Mor. (nec Chaud.).
= *Niponicus*, Lewis, Cat. Coleop. Jap.
Calosoma mikado,
= *Maximowiczi*, Mor.

Panagæus singularis.
= *Tinoderus* id., Chaud.
Chlænius hospes.
= *posticalis*, Mots., Chaud.
Chlænius subhamatus.
= *biguttatus*, Mots., Chaud.

* Some few single specimens taken by Mr. Lewis remain undescribed; these would bring the total to about 406.

Chlænius culminatus.
= *nigricans*, Wiedm., Chaud.
Harpalus lævicollis (nec Dufts.).
= *congruus*, Mots.
Harpalus Japonicus.
= *rugicollis*, Mots.
Harpalus argutoroïdes.
= *Oxycentrus* id., Chaud.
Harpalus relucens.
= *Iridessus* id., Bates.
Harpalus zabroïdes (nec. Dej.).
= *corporosus*, Mots.
Harpalus lucidus.
= *Iridessus* id., Bates.
Pristonychus æneolus.
= *Eucalathus* id., Bates.
Pristodactyla cyclodera.
= *Crepidactyla* id.
Trechichinæ.
= Perigoninæ.
Trechichus Japonicus.
= *Perigona Japonica*, Bates, Putz.
Triplogenius cuprescens.
= *Trigonognatha* id., Mots., Bates.
Pœcilus planicollis, Mots.?
= *encopoleus*, Solsky.
Pœcilus lepidus, nec F.
= *fortipes*, Chaud.
Pterostichus microcephalus (nec Mots.).
= *Lagarus nimbatus*, Mor.
Pterostichus Japonicus, Mots.
= *prolongatus*, Mor.
Pterostichus tropidurus.
= *prolongatus*, Mor.
Bembidium cognatum, Mor. (nec Dej.).
= *B. consentaneum*, Munich Cat.
Crepidogaster bicolor (nec Boh.).
= *Styphromerus Batesi*, Chaud.
Dromius quadraticollis (nec Mor.).
= *prolixus*, Bates.
Paraphæa signifera.
= *Anchista binotata*, Dej., Chaud.
Cymindis pictula.
= *Uvea* id., Fauvel.

With regard to the relations of the Geodephagous Fauna of Japan to that of other countries, the new material does not supply any facts to overthrow, or even to essentially modify, the views put forward in the Introduction to the paper of 1873. But though it can no longer be pleaded that our knowledge of the Japanese fauna in this department is too limited to justify any conclusions being drawn regarding its relations—for 400 species cannot be very far off the total number, seeing that our well-explored islands furnish only 311—our much less complete knowledge of the corresponding part of the faunas of Eastern Asia compels us to be cautious in our generalisations. We cannot, for example, accept as a final conclusion the large proportion of peculiar genera which the present state of our knowledge gives to Japan; although the later discoveries have not diminished it, the number in 1873 having been nine genera peculiar out of a total of 84, whilst now we find 11 out of a total of 114. Two of the former nine have since proved to be not confined to Japan, but found elsewhere, reducing the number to seven; but, on the other hand, four new endemic genera have been discovered. Nor can we determine with any degree of certainty, or even discuss to any good purpose, the question—To what part of the Asiatic mainland is Japan most nearly related in the temperate elements of its fauna? The great majority of the species of North

Temperate facies or affinities are peculiar, as far as we at present know, to Japan, and those which are not peculiar are as often Chinese species (found in the regions of the lower Yang-tsze, or more to the south) as they are East Siberian. The strong tropical element which constitutes the most striking feature of the Japanese insect fauna is confirmed by the new material; 30 of the now-known Japanese genera of *Geodephaga* being found elsewhere only in the tropics, chiefly in the Indo-Malayan region. The Palæarctic relations have, on the other hand, been strengthened by the discovery of several genera highly characteristic of that great province, such as *Elaphrus*, *Leistus*, *Ophonus*, *Stomis*, *Cillenum*, *Lymnæum*, and *Blechrus*, besides the somewhat less strictly Palæarctic *Pogonus*, *Broscosoma*, *Metabletus*, and *Demetrias*.

The peculiarly Palæarctic (or rather North-Temperate) genera found in Japan are fewer in number than the Tropical, being 18 only, but of the remaining genera of the fauna, 58 in number, the contained species are more nearly related to North-Temperate forms of the same genera than to those of other parts of the world; this may be said to be the case in *Carabus*, *Anchomenus*, *Harpalus*, and many others, though in such genera as *Cicindela*, *Chlænius*, *Lebia*, and others, the specific tropical element is undoubtedly of importance.

The prevailing character of the Japanese fauna in the great section of the Coleoptera to which this paper refers is, however, North Temperate. This is to be expected from the latitude and geographical position of the islands, but the large proportion of tropical genera and species is most remarkable, and forms a problem in geographical distribution of great interest and difficulty. Some of the species are at present known only from distant countries like Java, Burmah, and Assam—not allied, but identical species; others, including two genera (*Taicona* and *Amphimenes*), are peculiar, as far as we know, to Japan. Whether this element in the fauna was derived directly from the distant south by oceanic currents, or *viâ* the Philippines, Formosa, and the Loo Choo Archipelago, or again *viâ* the mainland of China, it is waste of time to discuss in the present state of our knowledge. Tropical forms of other groups of animals are known to range into temperate latitudes in Eastern Asia, but most of the tropical species of Japanese

Geodephaga are not known to occur in intermediate latitudes in China or in the islands just mentioned. Whether this absence is real, or due only to our want of knowledge, and whether, if real, the absence has been brought about by the destruction of the primitive forests of China, many of the tropical species being forest forms, must be left for decision to the time when the smaller species of Coleoptera in China shall have been collected with the same completeness as Mr. Lewis has done those of Japan.

Mr. G. Lewis' Itinerary (1880—1881).

Approx. altitude in figures (feet). Brackets indicate the chief excursions. Italics trained native collector sent at date.

1880.

Feb. 27.—Yokohama (Tokio), sea-level, until .....Mar. 16
Mar. 17.—Miyanoshita, 1390 (Kiga, 1390; Ashinoyu, 2759) ..... ,, 19
,, 20.—Yokohama (Bukenji, Oka, Kawasaki, Tokio, Kadzusa, Yokosuka, Oyama, 4100) .....April 14
April 15.—Miyanoshita, 1390 (Odawara, Tonosawa, 466; Ashinoyu, 2759) ..... ,, 16
,, 17.—Hakone, 2424 (Gongensama Temple, 2474) ... ,, 19
,, 20.—Suyama (base of Fujisan, Mishima, 59)..... ,, 22
,, 23.—Hakone, 2424 (elevated forests to the south, about 2788 feet).
,, 24.—Miyanoshita, 1390 (Kiga, 1391; Ojigoku, 4101; Miyagino, 1493; and Shinyuba, 2280; Oyu)..May 3
May 4.—Subashiri, 2723 (Otomi-toge, 3307; Gotemba, 1529; Fujisan, 12,360, to 3rd rest house, Kawaguchi lake) ..... ,, 10
,, 11.—Miyanoshita, 1390 (Oyu and Shinyuba, 2280).. ,, 14

Elevated forests above *Atami*, 4692, and *Yugashima*, in *Idzu*, 7 days.

,, 15.—Yokohama (Enoshima, Bukenji, Tokio)..... ,, 23
,, 24.—Oyama, in Sagami, 4100 ..... ,, 26
,, 27.—Yokohama ..... ,, 31
June 1.—Tokio.
,, 2.—Koga.
,, 3.—Nikkô, 2329 (Chiuzenji, 4272; Nantaizan, 8188; Niohozan, 7874) .....June 21
,, 22.—Nowata, on the Watarasegawa.

Tsukuba yama, 3609, 4 days.

,, 23.—Yokohama and suburbs .....July 5
July 6.—Steamer to Hokkaido..... ,, 8
,, 9.—Hakodatè.
,, 13.—Junsai Lake, beyond Nanaye (Suwaratake or Komanotake, 2742)..... ,, 17
,, 18.—Hakodatè (Ono, Akagawa, Nanaye) ..... ,, 27

Kakkumi, 3 days; *Matsumai*, 3 days.

July 28.—Junsai Lake (Nanayeyama) ..... July 30
,, 31.—Hakodatè ..... Aug. 2
Aug. 3.—Steamer to Otaru ..... ,, 4
,, 5.—Sapporo ..... ,, 16
,, 16.—Bibi.
,, 17.—Tomakomai.
,, 18.—Shiraoi.
,, 19.—Horobetsu ..... ,, 20
,, 21.—Mororan.
,, 22.—Steamer to Mori.
,, 23.—Hakodatè ..... ,, 29

Junsai, 3 days.

,, 30.—Steamer to Awomori.
,, 31.—Hirosaki (Iwakisan, 4921) ..... Sept. 2
Sept. 2.—Awomori (Soma, Tashironoyu, Yakotasan, 5000; Asamushi) ..... ,, 9
,, 10.—Hakodatè (Akagawa) ..... Oct. 9

Junsai, 2 days.

,, 19.—*Awomori, Tsudzureko, Akita, Sakata, Niigata, Sado, Nikkô** ..... ,, 29
Oct. 10.—Awomori and Kominato.
,, 11.—Shichinohe.
,, 12.—Sannohe ..... ,, 13
,, 14.—Ichinohe.
,, 15.—Morioka.
,, 16.—Hanamaki.
,, 17.—Midzusawa (Kitakamigawa).
,, 18.—Kannari.
,, 19.—Furukawa.
,, 20.—Sendai, 138 ..... ,, 22
,, 23.—Fujita.
,, 24.—Fukushima (Motomiya).
,, 25.—Koriyama.
,, 26.—Shirakawa.
,, 27.—Koyebori.
,, 28.—Yaita.
,, 29.—Nikkô,* 2329 ..... ,, 31
Nov. 1.—Utsunomiya, 384.
,, 2.—Tokio.
,, 3.—Yokohama ..... Nov. 15

Motomura, on *Oshima* or *Vries Island*, 5 days.

Dec. 20.—Miyanoshita, 1390 (Uyenoyu, Shinyuba, 2280).. Dec. 23

1881.

Jan. 1.—Yokohama, until ..... Feb. 9
Feb. 10.—Steamer to Nagasaki, *viâ* Suwonada.
,, 13.—Nagasaki (Tomatzu, Ipongi, Nita, Mitsudake, 1600; Tagami, Kompira, Suwa Temple, Akonora, Inasa, Mogikoba, Shimabara, Unsentake, Utsutsukawa, Mogi, Aba, Fukuda, Fukahori) ..... April 21

Goka, 1500, in *Kumakuni*, 17 days.

Oyayama, near *Kumamoto*, 13 days.

April 22.—Steamer to Kumamoto, in Higo.
,, 23.—Kumamoto (Goka Temple), 42 ..... April 26
,, 27.—Yatsushiro ..... ,, 28
,, 29.—Konosè, 800, on the Kumagawa.
,, 30.—Ichiuchi or Ikenoshimo, 900 (Higashimata) ... May 2
May 3.—Hitoyoshi, 1200 (Rakuwayama, 2200; Oguma).. ,, 8
,, 9.—Kuroheiji, 1300.
,, 10.—Yuyama, 3000 (Ichibosayama, 5000) ..... ,, 14
,, 15.—Hitoyoshi, 1200 (Oguma, 2000)..... ,, 17
,, 18.—Konosè, 800.
,, 19.—Yatsushiro.

Yuyama, 7 days.

,, 20.—Kumamoto ..... ,, 21
,, 22.—Nagasaki ..... June 3
June 4.—Steamer to Kobè, *viâ* Shimonoseki..... ,, 5
,, 6.—Kobe (Hiogo, Minatogawa, Sannomiya, Maiyasan, 1280) ..... ,, 9
,, 10.—Kioto (138) ..... ,, 12
,, 13.—Through Nara; crossing Yodogawa and Lake of Ogura, to Nikaido, in Yamato.
,, 14.—Left Nikaido, passing Yani and Tosanomachi to Natsumemura and Kamiichi, 613.
,, 15.—Kashiwagi, ? 2000 (Omine, 5643; Nishimura, Odaigahara, Ikenchaiya, and main road to Shingu) ..... ,, 24
,, 25.—Nara (285) ..... July 1
July 1.—Ogura Lake, 120.
,, 2.—Kioto (138) ..... ,, 4
,, 5.—Otsu (Biwa Lake, 240).
,, 6.—Osaka (Tsumiyoshi, Sakai) ..... ,, 8
,, 9.—Kobe ..... ,, 19
,, 20.—Otsu, 240 (Mayebara, Samegai).
,, 21.—Shinkano.
,, 22.—Hosokute (Kisogawa).
,, 23.—Nataksugawa.
,, 24.—Tsumago.
,, 25.—Agematsu.
,, 26.—Fukushima ..... ,, 29

Ontake, 10,000, 2 days.

,, 29.—Yagohara (Torii toge, 4016).
,, 30.—Seba (Shiwojiri toge, 2503).
,, 31.—Shimonosuwa (Suwa Lake, Akinomiya).
Aug. 1.—Wada toge, 5578.
,, 2.—Mochidzuki.
,, 3.—Oiwake, 3510.
,, 4.—Kurigahara (Usui toge, 4002) ..... Aug. 6
,, 7.—Matsuida.
,, 8.—Fukui.
,, 9.—Niregi.

Aug. 10.—Nikkô, 2329 (Imaichi, Niohozan, 7874) .....Aug. 18
,, 19.—Chiuzenji (Nantaizan, 8188; Yumoto, 5013)... ,, 24
,, 25.—Nikkô, 2329.
,, 26.—Ashiwo.
,, 27.—Omama.
,, 28.—Mayebashi.
,, 29.—Numata, 1417 (Yubiso).
,, 30.—Buno, 3008.
,, 31.—Shimidzu toge, 5184.
Sept. 1.—Muikamachi, 554.
,, 2.—Nagaoka, 72.
,, 3.—Sanjo, 65.
,, 4.—Niigata (Shinanogawa) .....Sept. 16

Sado (*Kinpokusan*, 1600), 13 days.

,, 17.—Nagaoka.
,, 18.—Horinouchi.
,, 19.—Urasa, 440; and Seki, 810.
,, 20.—Futai (Nakano toge, 2800)..... ,, 21
,, 22.—Yunoshiku (Mikuni toge, 4200).
,, 23.—Shibukawa.
,, 24.—Kumagai.
,, 25.—Tokio..... ,, 27
,, 28.—Yokohama (Uyeno, Honjo, Kawasaki) .....Nov. 3

The four principal islands of Japan or Dai-Nipon are:—Kiushiu, Shikoku, the main island (which has no native name), and Yezo. Hokkaido includes Yezo and the Kurile Islands.

Smaller islands from which specimens were obtained are:—Tsushima, Tanegashima, Amakusa, Oshima (Vries) and Sado.

A few specimens were obtained from Fusan, an open port in Chosen (Korea).

When no altitudes are given the places are usually at, or a little above, sea-level, and have not been measured.

CICINDELIDÆ.

Cicindela Niohozana.

Quoad formam *C. sylvaticæ* similis, supra cupreo-fusca fere ut in *C. hybrida*, elytris utrinque lunula interrupta humerali, fascia parum obliqua valde angulata maculaque rotundata submarginali ante apicem, flavescenti-albis, elytris passim haud profunde punctatis (punctis viridescentibus) et in interstitiis granulatis; labro albo, fere sicut in *C. gallica* sed longiori, medio basi valde convexo, antice medio longe producto, maris dente mediana valida, margine flexuoso, versus angulum antico-lateralem sinuato, fœm. antice

medio obtuse tridentato; palpis metallicis. Long. 16 mm., ♂, ♀.

Mt. Niohozan; flies like *C. Japonica*.

In colour and sculpture of the elytra this species, according to the description, must greatly resemble *C. Sachalinensis* of Morawitz; but it cannot be the same, as it is much nearer *C. Japonica* than *C. gallica* and *sylvicola*, with which latter alone Morawitz compares his species, and the form of the median fascia "more transverse" than *C. gallica*, besides the position of the subapical spot, which he terms "marginal," whereas it is remote from the margin, do not agree. The sculpture of the elytra agrees with Morawitz's description, as far as the mixture of shallow punctures and obtuse granules goes, but there are in addition distinct traces of the rows of larger punctures characteristic of the *C. sylvatica* group, of which Morawitz makes no mention; these punctures are very distinct along the basal depression on each elytron, but distinct traces also exist of the longitudinal row towards the suture. The under side of the thorax and the femora, with the sides of the basal ventral segments, are coppery red, scarcely shining, the rest of the abdomen and the legs brassy green; the sides of the sterna and the femora are clothed with coarse hair. The median fascia of the elytra is similar to that of *C. sylvatica*, with the important difference that it bends in the middle at a much more acute angle, and the inner part, or hook, dips down more and is much narrower than the outer or marginal part.

Cicindela ovipennis. (Pl. XIII., fig. 1).

Species singularis, elytris elongato-ovatis humeris nullis thoraceque elongato. Supra obscure rufo-cuprea, viridi-micans, elytris marginibus lætius cupreis, fascia brevissima mediana (a margine laterali distante) plus minusve curvata, transversim posita maculaque marginali ante apicem (interdum extus per marginem prolongata et virguliformi) albis (fasciola mediana nigro-marginata); capite sat magno exserto, thorace latiori; corpore subtus viridi-cupreo, ventro medio et apice obscuriori nitido; labro albo, convexo medio late modice producto, margine tridentato; palpis omnino metallicis. Long. 13½—15 mm., ♂, ♀.

Sado.

This curious species partakes of the characters of the two groups *C. campestris* and *C. germanica*, but the elytra are much more ovate than any other species known to me, *C. dromicoides* only approaching it in this respect. In the markings of the elytra it much resembles *C. Ismenia*. The head is moderately concave between the eyes, and somewhat regularly and strongly striated (more finely on the vertical forehead). The thorax is long and narrow, very slightly narrowed behind and with nearly straight sides, the surface vermiculate-rugose; the elytra are flattened and slightly explanated along the sides, and remarkably convex in the middle at three-fourths their length; their sculpture consists in bluish green punctures each surmounted (anteriorly) by a minute shining granule, and in an irregular row of much larger punctures each with a central golden point. The body beneath is glabrous, excepting (in some individuals) a few white hairs on the metasternum.

Cicindela Amurensis.

Cicindela amurensis, Morawitz, Bull. Acad. St. Petersb. 1863, p. 238; Bates, Trans. Ent. Soc. Lond., 1873, p. 227.

The typical form of this species, common in temperate latitudes of Eastern Asia from the Amur to the Yang-tsze, is, as described by Morawitz, $8\frac{1}{2}$—$9\frac{1}{2}$ mm. long, and of metallic colours on its upper surface. The elytra are punctured; the punctures, though shallow, being rendered conspicuous by being each on a bluish green spot, contrasted with the coppery hue of the ground colour; and on the anterior margin of each puncture is a minute bright speck, a rudimentary granule. As a decisive character distinguishing this species from *C. literata* and allies, I may mention that the trochanters in all the legs are red.

On the sea-shore of Hakodate, where Mr. Lewis on his recent journey has met with this species, it occurs in a high degree of development, some of the examples measuring 11 mm., and being proportionately more robust, with wider pale elytral markings and more rounded thorax. In the same locality he found the following allied form, sufficiently distinct to merit a specific name:—

Cicindela novitia.

C. literata longior et paullo gracilior, supra subolivaceo-nigra thoracis limbo interdum obscure cupreo, subtus femoribusque viridi-auratis nitidis trochanteribus rufis; thorace fere cylindrico, elytris opacis tenuiter granulatis haud perspicue punctatis; signaturis sicut in *C. amurensi* sed latioribus, scilicet lunula humerali, ramo inferiori elongato apice retrorsum (versus basin) hamato-clavato, fascia mediana maxime tortuosa, vitta mediana marginali, lunulaque apicali cujus ramo superiori valde elongata subrecte discum versus extenso. Long. $9\frac{1}{2}$—$10\frac{1}{2}$ mm., ♂, ♀.

Hakodate; Niigata.

Cicindela Sumatrensis, Herbst; Dejean, Sp. Gen. i., p. 88. Local var. *Niponensis.*

C. Sumatrensis is distributed, with very little local variation, over the whole Indo-Malayan region—Sumatra, Java, Bali, Ceylon, India, the Philippines, &c. In Japan it reappears in quite a northern locality, on the sea-shore at Niigata, in North-Western Nipon. Compared with the largest Indian specimens I find no difference, except the broader and more robust form (the thorax notably broader), the more obtuse angle described by the median fascia, from which it results that the inner portion of the fascia runs more obliquely towards the suture, and the existence of a minute granule on the anterior edge of each elytral puncture. The females measure $14\frac{1}{2}$ mm., the largest Indian females I have seen $12\frac{1}{2}$ ($5\frac{3}{4}$ lines): Dejean gives 5—$5\frac{1}{2}$ lines as the length of the species as known to him. The remarkable dilatation of the female elytra at one-third the length, and form of the labrum strongly unidentate in the middle, with the front edge straight and slightly oblique from the tooth to the anterior angles, are the same in both forms.

CARABIDÆ.

Omophron æqualis, Morawitz, Beitr. z. Käferf. der Ins. Jesso, p. 6; Bates, Trans. Ent. Soc. Lond., 1873, p. 229.

Mr. Lewis has met with this species under two rather distinct forms: in one, from Sapporo, near which place

Morawitz's specimen was derived, of rather larger size, the pale belts of the elytra are reduced in width and more or less interrupted; in the other, from Hiogo, rather smaller, the belts are wider (wider than they generally are in European specimens of *O. limbatum*). In both the sides of the thorax are straighter and the anterior angles longer than in *O. limbatum*.

Elaphrus dauricus, Morawitz, Bull. Acad. St. Petersburg, 1863, p. 239.

One example at Tomakomai, 17th August, 1880.

Nebria Lewisi, Bates, Ent. Mo. Mag. xi. p. 22 (1874).

Kawachi. Abundant under stones at Hakone Lake, and extends north to Morioka; also at Kumamoto.

Nebria Sadona.

Valde elongata, pedibus gracilibus, elytris antice gradatim angustatis sed humeris distinctis obtusis; nigerrima subnitida; capite parvo lævi, collo paullulum constricto; oculis modice convexis; thorace fere sicut in *N. fasciatopunctata* late cordato, angulis posticis retrorsum productis acutis, anticis rotundatis, margine laterali late explanato-reflexo; elytris profunde striatis, striis fundo subtiliter crenatis, interstitiis convexis tertio 4—5 punctato. Long. 14 mm., ♀.

Sado. A male example from Oyayama, of similar size and form, differs in the thorax being more gradually narrowed in front and with more produced fore angles. It is possible it may be the other sex of this species.

Nebria sæviens.

N. Sadonæ affinis. Elongata, subgracilis, nigra, partibus oris, antennis pedibusque (coxis exceptis) fulvorufis; capite fere lævi, collo convexo nullomodo transversim impresso, fronte foveis duabus parum impressis; oculis valde prominentibus; thorace relative magno, elytris vix angustiori, quadrato-cordato antice modice, nec rotundato-, angustato angulis anticis productis (apice obtusis), postice longe, sed parum angustato, subsinuato, angulis posticis retrorsum productis apice acutissimis, margine laterali explanato-reflexo, limbo

toto subrugoso-punctato; elytris lateribus subregulariter modice rotundatis, plica basali parum arcuato, humeris obtusis, apice oblique sinuatis, punctato-striatis interstitiis paullulum convexis, tertio 4-punctato punctis parum conspicuis, sternis utrinque parum profunde punctatis. Long. 11 mm., ♂.

Sado.

I know of no described species at all closely resembling this in form. It comes, perhaps, nearest to *N. Mannerheimi*, Fisch., but is of more slender form, with longer thorax, more gradually narrowed behind, and with broader reflexed margins and much longer hind angles.

Nebria reflexa.

Modice elongata, subgracilis, piceo-nigra, supra leviter iridea, antennis partibus oris pedibus (coxis inclusis) et thoracis elytrorumque marginibus (cum epipleuris) piceo-rufis; capite parvo post oculos sat angustato, collo supra transversim perparum impresso; oculis modice prominentibus; thorace relative magno, quadrato-cordato antice gradatim subrecte angustato, angulis anticis valde productis, postice quam antice multo magis angustato, angulis posticis productis et supra elytrorum basin elevatis, margine laterali late explanato, reflexo, basi punctato; elytris elongato-ovatis versus basin paullo angustatis, plica basali fere recta, angulo humerali obtuso sed distincto, punctulato-striatis, interstitiis vix convexis tertio punctis 4—5. Long. 8½—9 mm., ♂, ♀.

Iwakisan, under stones, September.

Var. *N. Niohozana.*

Distinctly larger and relatively longer (10½ mm.); thorax longer, base of antennæ and thighs sometimes darker piceous. Male and female.

Niohozan, under snow, June.

The species has a small head, like *N. Lafrenayei*. The thorax is similar in shape, but broader and more rounded on the sides.

Nebria Japonica.

N. Gyllenhalii affinis sed multo major et magis elongata. Nigra nitida tarsis palpisque picescentibus; capite lævi ante collum perparum transversim impresso

haud foveato, collo convexo, oculis prominentibus. Antennis valde elongatis articulis 5—11 piceo-fuscis; thorace sicut in *N. Gyllenhalii* transversim quadrato-cordato marginibusque punctatis; elytris elongato-oblongis, plica basali arcuata, angulo humerali distincto, punctato-striatis, interstitiis vix convexis tertio 5 punctato; corpore subtus fere lævi. Long. 10½—11 mm., ♂, ♀.

Iwakisan, abundant.

Appears to differ from all the numerous Siberian species of the *Gyllenhalii* group which have been described. *N. protensa*, Mots. (*anthracina*, Morawitz) seems to approach it most nearly, but, besides being smaller, it differs in the sculpture of the head and elytra.

Nebria chalceola.

Parva, convexiuscula, piceo-nigra elytris obscure viridi-æneis, antennis palpis tibiis et tarsis rufo-piceis; capite lævi postice transversim impresso; oculis magnis convexis; thorace relative magno, quadrato, postice minime angustato, ante medium leviter rotundato, angulis anticis parum productis posticis rectis, margine laterali late explanato-reflexo interdum rufescenti, supra (punctis nonnulis basi exceptis) lævi, polito, foveisque profunde impressis; elytris brevius oblongo-ovatis, striis punctato-crenatis versus latera et apicem evanescentibus, plica basali recta transversa, angulo humerali dentiformi; corpore subtus lævissimo; processu mesosternali minus elevato, supra declivi. Long. 6½—7 mm., ♂, ♀.

Hakone, Oyama, Niohozan.

A very distinct species. At first sight resembling a small *Pterostichid* much more than a *Nebria*. It is less slender in all its parts than other *Nebriæ*, and the antennæ are distinctly shorter. The elytra are dark bluish green, metallic.

Nebria Snowi.

N. Germari subsimilis, sed oculis magis prominulis elytrisque versus basin minus angustatis, &c. Nigro-picea elytris leviter purpurascentibus antennis palpis pedibusque obscure piceis his interdum rufo-piceis; capite lævi postice (medio collo) fovea lineari impresso; oculis valde prominentibus; thorace elytris multo angustiori, relative parvo, quadrato-cordato, postice (prope

basin) fortiter angustato sed parum sinuato angulis posticis acutis anticis subacutis, margine laterali anguste explanato-reflexo, dorso fere lævi; elytris elongato-ovatis versus basin angustatis, plica basali retrorsum obliqua, angulo humerali obtuso sed distincto, striis parum impressis hic illic undulatis indistincte punctulatis, interstitiis vix convexis tertio punctis 5. Long. 10½ mm., ♂, ♀.

Ketoi, one of the Kuriles, under stones (*Mr. Snow*).

The punctures on the third interstice are continued as transverse impressions across the interstice. The thorax differs from that of *N. Germari* in being less rounded anteriorly, less sinuated at the posterior constriction (the acute hind angles standing out in consequence much less), and in the lateral margins being broader and much more reflexed.

Nebria jamata, Motschulsky, Bull. Mosc. 1865, iv. p. 281.

North Japan; Kurile Is.

This species is classed by its author in his *brevicollis* group, and therefore cannot have anything in common with the *N. Snowi* above described. I have not seen any insect answering to the description.

Leistus crassus.

L. spinibarbi paullo major et multo convexior, subæneo-niger, nitidus; antennis partibus oris pedibusque testaceo-rufis; capite ruguloso-punctato, media fronte læviori ibique fovea elongata, collo sulcato-constricto, labro medio haud producto, mandibulis longe productis; thorace latissimo, disco excepto grosse punctato, medio valde dilatato-rotundato, postice contracto et rectilaterali, angulis rectis, marginibus sat late explanatis; elytris oblongis, mox pone humeros latioribus, postea paullulum angustioribus, sat grosse punctato-striatis, prosterno toto, pectoris ventrisque (ad basin) lateribus grosse punctatis. Long. 9½—10 mm.

Rakuwayama, near Hitoyoshi.

Much more convex and robust than any other species known to me; black, with a slight brassy or purplish tinge.

Leistus alecto.

L. laticollis (Mor.), Putzeys, Ann. Soc. Ent. Belg. 1875 ?

L. piceo quoad formam haud dissimilis, sed elytris versus basin minus angustatis; *L. laticolli* (Moraw.) affinissimus, differt solum elytris paullo longioribus et postice magis dilatatis, colore obscuriori subæneo-tincto. Elongatus, gracilis, piceo-niger subæneo-tinctus; antennis (articulis 1- vel 1—4 leviter infuscatis) partibus oris tibiis et tarsis testaceo-fulvis; capite convexo, lævi, collo sulcato-constricto; thorace minus lato, subrotundato, lateribus postice ante angulum rectis, margine antice et postice plus minusve punctato; elytris elongato-ovatis ab ultra medium usque ad basin gradatim angustatis sed humeris magis quam in *L. piceo* perspicuis, sat profunde punctulato-striatis, striis versus latera et apicem evanescentibus; prosterno medio pectoreque lateribus sparsim grosse punctatis. Long 9—9½ mm., ♂, ♀.

Sapporo; Nikko.

The tendency of the striæ on the sides and the apex to become more feebly impressed or to disappear altogether is common to this species and to a distinct East Siberian one, four examples of which I obtained from the Maack collection, and which agree very well with *L. laticollis*, Mor.

Leistus prolongatus.

Valde elongatus, antennis (articulis 1—4 infuscatis) partibusque oris fulvo-testaceis, tibiis et tarsis rufo-piceis, palpis maxillaribus apice intus guttula nigra; capite quam in *L. spinibarbi* longiori, oculis minus prominentibus, mandibulis maxillisque multo magis elongatis, vertice valde convexo collo constricto; thorace subovato, antice modice rotundato postice gradatim usque ad angulos posticos obtusos (fere rotundatos) angustato, basi tantum punctato; elytris maxime elongatis, angustis, postice convexis, medio subparallelis, prope basin gradatim angustatis, basi (apud plicam) angustis, humeris nullis, punctato-striatis, interstitiis sat convexis. Long. 10½ mm., ♂.

Oguma, in Higo. One example in May.

Distinguished from all *Leisti* known to me, except the two following, by the form of the thorax, the lateral margin not straightening to form the usual rectangular hind angles. This form of thorax appears to occur also in *L. caucasicus*, a species which I have not seen. *C. rotundicollis*, Motsch., may possibly be similar, but the author does not describe the hind angles.

Leistus obtusicollis.

L. prolongato proxime affinis sed minus elongatus; *L. piceo* similis et differt precipue statura majori thoracisque angulis posticis obtusis. Piceo-niger, partibus oris (palpis totis) antennis (scapo solum infuscato) tibiis et tarsis testaceo-fulvis; capite supra convexo, collo constricto, mandibulis longe ultra labrum prolongatis; thorace fere sicut in *L. piceo*, subovato, postice subrecte usque ad angulos obtusos angustato, marginibus anticis et posticis ruguloso-punctatis; elytris modice convexis, elongato-ovatis, antice angustatis, ad basin angustissimis, punctato-striatis, interstitiis sat convexis; sternis abdominisque basi utrinque grosse punctatis. Long. 9½ mm., ♂, ♀.

Hakone, in May; in moss on the trunks of *Cryptomeria* at Gongensama Temple.

Besides the rather smaller size and the more widely spread punctuation of the thorax, this species differs from *C. prolongatus* in the decidedly shorter and relatively broader and less parallel-sided elytra. In *L. obtusicollis* the elytra have rounded sides, and are narrowed from behind the middle to the base; elytral shoulders there are none, though the very oblique basal plica joins the margin at a distinct angle.

Leistus subæneus.

L. prolongato et *L. obtusicolli* affinis, sed elytris brevioribus et latius ovatis; niger supra obscure olivaceo-æneus nitidus, antennis (articulis 1—4 plus minusve infuscatis) partibusque oris fulvo-testaceis, tibiis et tarsis rufo-piceis; capite et thorace sicut in *C. obtusicolli*, sed hoc antice et postice obsolete punctato, postice usque ad angulos subrecte angustato, angulis pedunculo arcte adhærentibus obtusis; elytris brevius ovatis, paullo ante

apicem latis, deinde usque ad basin subrotundatim angustatis, ad basin angustissimis, olivaceo-æneis punctato-striatis, interstitiis sat convexis. Long. $8\frac{1}{4}$—$8\frac{1}{2}$ mm.

Nikkô, under moss in forests at high elevations, in early summer.

Carabus granulatus (Lin.), var. *telluris*, Lewis, Trans. Ent. Soc. Lond., 1882, p. 526.

C. granulato quoad formam simillimus; a typo differt thorace creberrime vermiculato-rugoso et punctato elytrisque inter interstitia catenata costa unica nitida. Niger obscure viridi vel cupreo-tinctus, parum nitidus. Long. 23 mm.

Tonosawa, Central Japan.

Neither this nor the following species or local subspecies is the *C. Maacki*, Morawitz, as Mr. Lewis at first thought (*loc. cit.*). *C. Maacki* is said by Motschulsky to be an East Siberian variety of *C. conciliator*, a species well distinguished from *C. granulatus* by the scale-like minute sculpture of the elytra. In *C. telluris* the elytral interstices are thickly covered with small separate granulations, more distinct from each other than in the typical *C. granulatus*, and this does not agree with Morawitz's description, "interstitiis rugulosis et granulatis." The tubercles of the "chain-striæ" are shorter than is usual in the European *C. granulatus*, resembling in this respect the ordinary varieties of the species so abundant in East Siberia.

Carabus Yezoensis.

C. granulato affinis sed differt elytris magis convexis et ovatis; viridescenti-niger, opacus; capite et thorace creberrime vermiculato-rugosis, hoc sicut in *C. granulato* sed postice (mox ante basin) fortius sinuato-angustato; elytris elongato-ovatis, lateribus in utroque sexu rotundatis, inter interstitia catenata tricostulatis, costulis fere æqualibus rugulosis, mediana tantum hic illic lævi, interstitiis crebre asperato-granulatis; apice sicut in *C. granulato* sat profunde sinuatis. Long. 26 mm., ♂, ♀.

Sapporo, and across to Junsai Lake.

Although belonging to the *granulatus* group, this species differs too much in form and sculpture to be treated as a simple local form of *C. granulatus*. Its facies is

entirely different, owing to its more ovate and convex elytra, its opaque surface, and minute sculpture; the short tubercles of the chain-striæ and some parts of the median raised lines alone being smooth. It is probably the *C. granulatus* var. of Yezo described by Morawitz as elytra "mit drei rauhen flachen Längsrippen."

Carabus Van Volxemi, Putzeys.

Putzeys, Ann. Soc. Ent. Belg., xviii. (1875), p. 2.

Chiuzenji, Suyama, Wada-togé. Island of Sado.

Like all other species of this genus, *C. Van Volxemi* varies in sculpture and in form. At Awomori a variety occurs in which the tubercles of the chain-striæ are broader than in the type.

Carabus conciliator, Fischer.

Fischer, Ent. Russ., i., p. 102; pl. 10, fig. 25; Dej., Sp. Gen., v., p. 542.

Sapporo and Cape Soya; two examples, not differing from others from Lake Baikal.

Carabus Mæander, Fischer.

Fischer, Ent. Russ., i., p. 103; Dej., Sp. Gen., ii., p. 486.

Sapporo; two examples, differing from East Siberian specimens only in the elytral tubercles being much narrower and less ovate in shape.

Carabus aquatilis.

C. clathrato affinis; major, multo magis elongatus. Oblongo-elongatus supra nigro-æneus (elytris precipue fœm. subopacis); capite thoraceque nitidis, illo relative parvo, sparsim punctato, juxta oculos convexos multistrigoso, hoc sat elongato antice gradatim (vix arcuatim) angustato, versus basin breviter sinuato, basi dilatato, angulis posticis perparum retrorsum et extrorsum productis, basi utrinque late haud profunde sinuato, marginibus lateralibus reflexis, margine ipse incrassato; elytris maxime elongato-oblongis, apice sinuatis, utrinque costis tribus angustis valde elevatis, interstitiis late con-

cavis, subtiliter granulatis, singulo serie tuberculorum angustorum foveolis vix impressis et haud metallicis separata; subtus nigro, lævi polito. Long. 30—34 mm., ♂, ♀.

Shimonosuwa Lake. Taken plentifully by pressing down the aquatic weeds floating round the margin of the lake.

A fine and well-marked species, nearest allied to *C. clathratus*, but different in shape and wanting the metallic foveæ of the elytra. The tubercles in the broad furrows are always narrow, and are sometimes scarcely elevated or perceptible.

Carabus procerulus, Chaudoir.

Chaudoir, Rev. & Mag. Zool., 1862, p. 486.

Yokohama. Elevated forests in Central Japan, Chiuzenji, Morioka, Awomori. Winters under bark, and in summer comes freely to sugar. Also one specimen on Oyayama in Kiushiu.

Mr. Lewis in his notes distinguishes as a separate form the Yokohama specimens (of which he has only three) and those from the other localities above mentioned. The only difference I can detect is a slight modification in the outline of the thorax; the Yokohama form being less cordate, *i. e.*, the sides are more gradually rounded immediately behind the anterior angles and less contracted behind. This difference, however, is not constant, and specimens from distant localities are as nearly as possible identical in form of thorax. The females vary in the more or less elongate-ovate form of the elytra.

Carabus arboreus, Lewis.

Lewis, Trans. Ent. Soc. Lond., 1882, p. 526.

Paullo minus elongatus, fuligineo-niger opacus; thorace quam in *C. procerulo* breviori ante medium magis rotundato-dilatato angulisque posticis minus elongatis vix retrorsum productis; elytris quoad sculpturam simillimis, sed minus prolongatis, fœm. ovatis; segmentis ventralibus sine sulculo basali. Long. 27—32 mm., ♂, ♀.

Sapporo, Bibi, and Junsai; Yezo. In damp forests under bark and logs.

Of quite different facies from the long and narrow type-form of *C. procerulus* from Yokohama, but nevertheless linked with it by intermediate varieties found in intermediate latitudes. It is relatively shorter and especially in the female more ovate than *C. procerulus*, and the thorax is slightly more rotundate-dilated anteriorly and more contracted posteriorly. In all examples of *C. procerulus* there is a fine arcuated transverse groove across the basal part of the ventral segments, of which there are scarcely any traces in *C. arboreus*.

Carabus exilis.

C. procerulo proxime affinis sed multo minor et adhuc gracilior. Valde angustatus, fuligineus opacus; capite coriaceo; thorace elongato, subcordato-quadrato, antice modice rotundato et postice parum sinuato-constricto, angulis posticis sat productis, dorso creberrime rugulosopunctulato, rugulis transversis nec vermiculatis; elytris angustis, parallelis (fœm. lateribus paullo rotundatis) apice fere integris (ad suturam subprolongatis), dorso utrinque striis catenatis 3, lineis elevatis 3 alternatis, omnibus angustis et granulatis, subnitidis, interstitiis depressis opacis haud punctatis minute granulatis; subtus sulculis ventralibus obsoletis. Long. 20—24 mm., ♂, ♀.

Island of Sado.

To all appearance a dwarf form of *C. procerulus*; but, besides its exceedingly slender (and in the male parallel-sided) form, it differs distinctly in sculpture, the three raised lines between the chain-striæ being uninterrupted, and the striæ proper or depressed interstices between the raised lines being opaque, with a few granules. In its typical state *C. exilis* appears to occur only in the Island of Sado. There are scarcely any traces of impressed punctures in the striæ proper.

Carabus tenuiformis.

C. exili proxime affinis et similis sed differt elytris punctato-striatis. Long. 21—23 mm., ♂, ♀.

Niohozan and Chiuzenji.

There is scarcely any difference in form between this and *C. exilis*, but the striæ (or depressed interstices of

the raised lines) have throughout a range of conspicuous punctures. The three raised lines between the chain-striæ are continuous and crested with shining granules, as in *C. exilis*, and the elytra in the male are narrow and nearly parallel, as in that species. The thorax varies as usual in the degree of dilatation in front, but it is always elongated, as in *C. procerulus* type, and in some examples very gradually narrowed (with little curvature) from near the middle to the anterior angles.

Carabus gracillimus.

C. exili affinis et similis, sed differt elytris (mas) haud parallelis, ab humeris usque prope apicem gradatim dilatatis. Gracillimus, fusco-piceus opacus (individuis maturis leviter ænescens); thorace relative minori et angustiori subcordato-quadrato; elytris sicut in *C. tenuiformi* punctato-striatis, stria-catenata conspicuori (tuberculis elongatis validioribus) sed costulis tribus irregularibus, multo minus elevatis, mediana excepta hic illic obsoletis. Long. 20—21 mm. ♂, ♀.

On the summit of Ontake end of July, when snow still remained in patches.

Differs at first sight from both the preceding in the less parallel outline of the elytra, especially of the male; the sculpture also differs in the fine raised lines being less elevated and sharply defined.

Carabus Fujisanus.

C. exili similis, differt tantum statura majori, elytrorum costulis triplicibus minime elevatis interdum obsoletis. Elongatus, gracilis, elytris sicut in *C. exili* postice perparum ampliatis; fuligineus opacus; thorace elongato angusto, antice vix rotundato, versus apicem gradatim angustato, postice sinuatim constricto. Long. 22—25 mm., ♂, ♀.

Subashiri, near Fujisan.

This form comes a little nearer *C. exilis* than either of the two preceding; but the sculpture of the elytra, especially in the female, recedes very considerably from the Sado species. The triple raised lines are obtuse, scarcely elevated (sometimes scarcely distinguishable), and the granulations, spread over the whole elytra, do

not form such regular rows on the summits of the lines; the depressed interstices or striæ have perceptible punctures. A remarkable feature in the thorax of the female is that the flanks are visible, in the middle on both sides, when the insect is viewed from above. As in *C. exilis*, and to a less degree in the allied forms, there is a submarginal shining streak extending for a short distance from the shoulders of the elytra.

The four preceding are without doubt no other than so many local forms of one species, but it would be difficult to frame a description to fit the whole, and if they were treated as one there would be no valid reason for not including *C. procerulus* and its cognate forms with them.

Carabus porrecticollis.

Valde elongatus et angustus, supra fere opacus, niger, capite thoraceque violaceis; capite postice (cum collo) punctato, oculis valde prominentibus, collo angusto; thorace valde elongato, lateribus perparum arcuatis, a medio usque ad apicem gradatim et paullo angustato, postice adhuc minus et subrecte angustato; angulis posticis sat productis (apice obtusis) margine basali recto, dorso sat crebre ruguloso-punctulato; elytris sicut in *C. procerulo* apice perparum sinuatis; mas elongato-oblongis, fœm. elongato-ovatis, dorso striis catenatis tribus et inter has lineis tenuissimis elevatis tribus, (interspatio suturali duabus tantum) interstitiis depressis subcancellato-punctatis, lineis et interstitiis granulatis; ventris segmentis basi arcuatim acute sulcatis. Long. 28—30 mm., ♂, ♀.

Urasa, and on the north-west coast at Akita and Sakata; a local species.

Undoubtedly belonging to the *procerulus* group, but distinguished by its long thorax, with scarcely rounded or flexuous sides, as well as by its colour and the sculpture of the elytra. The tubercles of the chain-striæ are sometimes narrow and linear, almost as in *C. procerulus*, and sometimes much broader. The fine triple elevated lines vary in elevation, the middle one of the three respectively sometimes being alone elevated, and all are crested with granulations. The depressed intervals or striæ have each a row of large impressions mostly extending quite across the interval.

Carabus opaculus, Putzeys.

Putzeys, Ann. Soc. Ent. Belg., xviii. (1875), p. 2.

South Yezo; Sapporo, Bibi, and Junsai Lake; in damp forests.

Belongs also to the *procerulus* series, but developed in a contrary direction from *C. exilis* and allies, its form being relatively short, compact, and rounded.

Carabus Dehaanii, Chaudoir.

Chaudoir, Bull. Mosc., 1848., iv., p. 452; *C. japonicus*, Thomson, Opusc. Ent., fasc. vii., p. 728.

Confined to the warm area south of the Biwa Lake; abundant and constant in form and colour from Kagoshima to Kioto, a distance of 400 miles; and occurs also in Tsushima and in the south of Korea.

Carabus insulicola, Chaudoir.

Chaudoir, Rev. & Mag. Zool., 1869; *C. Kaempferi*, Thoms., *l. c.*

From Biwa Lake to Awomori, an extent of 500 miles.

Carabus Yaconinus, Bates.

Bates, Trans. Ent. Soc. Lond., 1873, p. 231.

An offshoot from *Dehaanii*, existing only in that part of Japan where the parent type is abundant (*G. Lewis*).

Carabus Albrechti, Morawitz.

Morawitz, Bull. Acad. St. Petersb., 1863, p. 321. Syn. *vide* Bates, Trans. Ent. Soc. Lond., 1873, p. 234.

Spread over all the islands, a space of 1300 miles.

Mr. Lewis obtained a handsome variety of this species, one male at Suyama (base of Fujisan), and one female at Sawara, the whole upper surface of which is of a golden-coppery colour (the epipleuræ and prothoracic episternum also metallic), and the striæ conspicuously crenated. The inner edge of the male fore tibiæ is distinctly angulated, as in *C. maiyasanus*, not obtusely prominent, as in the typical *C. Albrechti*.

Carabus Maiyasanus, Bates.

Bates, Trans. Ent. Soc. Lond., 1873, p. 232; Lewis, Trans. Ent. Soc. Lond., 1882 p. 526.

Limited to a comparatively small area, and then occurring only at considerable elevations. The head-quarters of it are in the Idzu Province, but Mr. Lewis has specimens from Oyayama, near Kumamoto, in Kiushiu.

It is agreed to be a mountain variety of the southern form of *C. Albrechti*.

Var. Minor et angustior. Long. 20 mm.

Hakone.

Carabus Gehinii, Fairmaire (var. *C. grandis*, Pl. XIII., fig. 3).

Fairmaire, Petites Nouvelles Entom., vol. ii., p. 37 (1876); Waterhouse, Aid to Identif. of Ins., part 16 (Jan., 1883).

A male example obtained at Sapporo, Yezo, is figured by Waterhouse as above cited; a large female, also obtained by Mr. Lewis, differs from the male in its broader thorax, and the raised elytral striæ being interrupted by punctures. This he has provisionally named *C. grandis*.

Carabus tuberculatus, Fischer and authors.

Occurs on the mountains in S. Japan, and is common in the streets of Sapporo, nearly at sea-level.

This species, already recorded from Japan, I here add simply to complete the enumeration of the species now known from Japan of the genus *Carabus*. They are now twenty-one in number.

Damaster blaptoïdes, Koll.

According to Mr. Lewis, in the excellent account he has given of the distribution of the species of *Damaster* (in Ent. Mo. Mag., vol. xvii., 1880, p. 159), *D. blaptoïdes* is confined to Kiushiu, in Southern Japan.

Var. *Lewisi*, Rye.

On Shimabara, near Nagasaki, and at Hiogo; a half-starved form, so to speak, of *D. blaptoïdes* (*G. Lewis*).

Damaster pandurus, Bates.

Yokohama and S. E. Japan.

Var. *cyanostola*, Lewis.

Lewis, Trans. Ent. Soc. Lond., 1882, p. 524; *pandurus* var., Ent. Mo. Mag., xvii., 1880, p. 60.

Rather more slender in form than the *D. pandurus* of the vicinity of Yokohama, and with a more distinct blue tinge; the thorax of richer blue colour.

Mountains of Chiuzenji, lat. 36° 30′.

Damaster Fortunei, Adams.

Adams, Ann. & Mag. Nat. Hist., 1861, p. 59; Bates, Trans. Ent. Soc. Lond., 1873, p. 230; Lewis, Trans. Ent. Soc. Lond., 1882, p. 524. *D. viridipennis*, Lewis, Ent. Mo. Mag., xvii. (1880), p. 161.

Awa-Sima, Tabu-Sima (*Adams*); Akita, Awomori, and Ichinohe (*Lewis*).

Allied to *D. rugipennis* more nearly than to *D. pandurus*, having three dilated joints with brush-soles in the male fore tarsi. Mr. Lewis is convinced that his *D. viridipennis* is the same as *D. Fortunei*.

Damaster rugipennis, Motsch.

Motsch., Etud. Entom., x., p. 6; *D. auricollis*, C. Waterhouse, Trans. Ent. Soc. Lond., ser. 3, v., p. 569.

Yezo, from Hakodate to Cape Soya in the extreme north.

Damaster capito, Lewis.

Lewis, Ent. Mo. Mag., xvii. (1881), p. 197.

Island of Sado; not obtained on the second visit in 1881.

Differs from all other described species by its more compact form, broader and shorter both in trunk and limbs; also by the total absence of mucrones, the apex of the elytra being formed very similarly to that of *Carabus procerulus*.

Calosoma Maximowiczi, Morawitz.

Morawitz, Beitr. z. Käferfauna Ins. Jesso, p. 20; *C. mikado*, Bates, Trans. Ent. Soc. Lond., 1873, p. 235.

Foot of the Komanotake; taken in abundance by shaking young oak trees.

Calosoma Chinense, Kirby.

Kirby, Linn. Trans., xii., 1818, p. 379.

Sapporo, Yezo. Two examples obtained by Mr. Adachi, a native collector.

Cychrus convexus, Morawitz.

Morawitz, Beitr. z. Käferfauna Ins. Jesso, p. 7.

Hakodate and Sapporo. Taken feeding on *Helix pauper* (*Gould*).

Dyschirius Yezoensis.

D. polito simillimus, sed differt thorace magis ovato postice et antice fere æqualiter angustato. Supra æneo-nitidus, scapo rufo, pedibus rufo-piceis, femoribus anticis submetallicis; elytris minus cylindricis, elongato-subovatis, profundius quam in *D. polito* (sed minus profundis quam in *D. impunctipenni*), striatis, striis (versus apicem exceptis) crenato-punctatis, lateraliter et ante apicem interdum evanescentibus sed juxta apicem 1ma et 2nda 7ma et 8va semper profunde insculptis. Long. $4\frac{1}{2}$ mm.

Yezo; Hakodate and Sapporo.

Belongs to the same group as the European *D. politus*, and offers no perceptible difference in the form of head, anterior tibiæ, &c. But the thorax, especially when viewed from the front, is seen to be distinctly more ovate and less trapezoidal, the greatest width being nearly in the middle. The elytra also are conspicuously less cylindrical, being rounded on the sides, more strongly so a little behind the shoulders. In its normal state the colour is bright brassy, but individuals occur of a dull purpurascent pitchy hue, sometimes reddish at the tips of the elytra.

The species is similar to *D. cheloscelis* from South

Japan, which has, however, a much wider thorax, rufous antennæ, &c.

D. stenoderus, Putzeys (Ann. Soc. Ent. Belg., 1873) from Shanghai, seems to be a nearly-allied species, but rather larger, 5 mm.

Dyschirius glypturus.

D. Yezoense simillimus, sed multo minor, tibiis anticis denticulo inferiori-exteriori distincto, etc. Obscurius æneus, politus, scapo calcaribus tarsisque anticis testaceo-rufis, pedibus piceo-rufis (femoribus anticis obscurioribus) palpis nigris ; mandibulis angustis (extus haud dilatatis) acutissimis ; thorace ovato nec subtrapezoidali ; elytris sicut in *D. Yezoense* elongato-ovatis sed striis parum impressis conspicue (versus apicem exceptis) punctatis, juxta apicem 7ma et 8va oblique æqualiter profunde insculptis. Long. $3\frac{1}{2}$ mm.

Hakodate, on the sand-hills.

Similar to *D. Yezoensis* in outline of thorax and elytra, but of darker brassy hue, and distinguishable by the acute external denticulation of the anterior tibiæ at the base of the terminal spine, which latter is curved, and is equal in length to the spur, both, as well as the tarsi, being pale red. The mandibles are narrow. The elytra are sculptured at the apex, similarly to those of *D. Yezoensis*, *politus*, and allies, but the 7th and 8th striæ are relatively much more deeply and equally impressed, and run obliquely for a longer distance, and are the more distinct as the ninth interval is more tumid at the apex, making the latter appear broadly obtuse.

Broscosoma elegans. (Pl. XIII., fig. 7).

Valde convexum ; politissimum, antennis partibus oris pedibusque piceo-fulvis ; elytris breviter ovatis (humeris nullis) valde punctato-striatis. Long. $8\frac{1}{4}$—9 mm., ♂, ♀.

Niohozan and Nantaizan, at 7000 to 8000 feet elevation.

This elegant and curious Carabid is distinguished from the only others known of the genus (*B. Baldense* and *B. Ribbei*), by the ovate, almost gibbous, deeply punctate-striate elytra. The facies is rather that of *Disphœricus*

than of *Broscosoma*, but it undoubtedly belongs to the latter genus. The head is similar in form to that of *B. Baldense*, but it is smooth and polished, with the two furrows on each side over the base of the antennæ more clearly marked, and the mandibles and palpi more elongated and porrected. The antennæ are much thinner, and the fine pubescence does not begin before the 4th joint. The thorax is globose-ovate and highly polished, equally narrowed behind and before; the base forms a thickened scabrous ring, separated from the convex disk by a groove, the clavate femora contrasting strongly with the slender tibiæ and tarsi. The legs are long and slender, and the three dilated joints of the male anterior tarsi are slender oblong-quadrate, clothed beneath with fine hairs.

Panagæus japonicus, Chaudoir.

Chaudoir, Bull. Mosc., 1861, ii., p. 356; *P. rubripes*, Moraw.

Very abundant at Hakone and Miyanoshita in moss and rotten stumps of trees, and in similar places as far north as Sapporo.

Panagæus robustus, Morawitz.

Morawitz, Bull. Acad. St. Petersb., 1863, p. 323.

Yezo; Junsai, Sapporo, and Shiraoi.

A var. (*niponensis*) of much smaller size occurs in the plains of Fujisan measuring 9½ mm., the Yezo form being 11—12 lines long.

Panagæus singularis, Bates, Trans. Ent. Soc. Lond., 1873, p. 245, forms the type of the new genus *Tinoderus*, Chaudoir, Monographie s. l. Panagéides, p. 75.

Peronomerus fumatus, Schaum.

Schaum., Ann. Soc. Ent. Fr., 1853, p. 440; *P. æratus*, Chaud., Bull. Mosc., 1861, p. 354; *id.*, Monogr. s. l. Panagéides (1878), p. 82.

One specimen of this Chinese species was obtained by Mr. Lewis at Ogura Lake.

Peronomerus nigrinus, Bates.

Bates, Trans. Ent. Soc. Lond., 1873, p. 245.

Entirely confined to dry elevated slopes at Nagasaki and near Kioto, and distinct from *P. fumatus*, Lewis.

Peronomerus auripilis.

P. fumato proxime affinis sed differt statura majori, præcipue longiori, thoraceque relative angustiori, antice longius rectiusque angustato, medio fortius angulato et producto, postice valde sinuato angulis posticis productis dentiformibus. Elongato-ovatus, viridescenti-æneus pube erecte fulvo-aurato dense vestitus; antennis piceis, articulo basali palpis pedibusque fulvo-testaceis. Long. $9\frac{1}{2}$ mm., ♂, ♀.

Marshes, Ogura Lake; Uyeno and Honjo, in Tokio. Rare.

Rather larger than Canton examples of *P. fumatus*; nearly the same in colours, sculpture, and clothing, but differing in its slightly more elongate form, especially that of the thorax, which is much narrower, and is more lengthened anteriorly from the very prominent lateral angle to the head.

Chlænius prostenus, Bates.

Bates, Trans. Ent. Soc. Lond., 1873, p. 325.

Margins of the Ogura Lake, near Kioto.

Previously known only from Kiu-Kiang, on the Yang-tsze, China.

Anisodactylus tricuspidatus, Morawitz.

Morawitz, Beitr. z. Käferfauna Ins. Jesso, p. 66.

In addition to Hiogo, previously recorded, Subashiri, Niigata.

Ophonus constrictus.

Harpalo lævicolli haud dissimilis; major, piceo-niger nitidus, antennis palpis pedibusque testaceo-rufis; supra toto sparsim subtiliter punctatus, thorace basi densius et grossius subconfluenter punctato; capite fere ut in *Harpalo fuliginoso* magno, post oculos tumidulo, foveis frontalibus profundis rugosis, extus obliquis sed versus

oculum haud lineam impressam emittentibus; thorace late cordato, antice valde rotundato ante basin constricto, angulis posticis rectis, fovea utrinque basali lineari; elytris relative brevibus, sat convexis, apice oblique sinuatis, profunde subpunctulato-striatis, interstitiis paullo convexis 3io impunctato; tarsis supra pilosis. Long. 10 mm., ♂.

Oyayama, near Kumamoto. One example only in March.

Not much resembling any *Ophonus* known to me; but comes nearest *O. cordatus*, differing, however, in the much scantier punctuation. It resembles most *Harpalus leptopus* and *congruus*, but has not the oblique line of the forehead connecting the frontal fovea with the orbit, as in those species.

Harpalus vicarius, Harold.

Harold, Deutsche Ent. Zeitschr., 1878, p. 66.

Von Harold gives this name to the Japanese form of *H. ruficornis* mentioned by Morawitz and myself as having obtuse hind angles to the thorax. Among five East Siberian examples I find nearly all the intermediate gradations between *vicarius* and *rufescens*, but none with hind angles so rectangular as in the European form. Some males of *vicarius*, with smooth disc of thorax, again connect the species with *H. griseus*.

Harpalus tridens, Morawitz.

Morawitz, Beitr. z. Käferfauna Ins. Jesso, p. 69.

Hakodate and Niigata; Hagi (*Miller*).

Closely allied to *H. rugicollis*, Motschulsky, and also to the European *H. calceatus*. The extent of punctuation and pubescence on the sides and apex of the elytra varies. In one of Mr. Lewis' examples the whole elytra, with the exception of the sutural interstice, is punctured.

Harpalus rugicollis, Motsch.

Motsch., Etud. Ent., x., p. 5; Harold, Abhandl. Nat. Ver. Bremen, iv., 1875, p. 285. *H. japonicus*, Morawitz, Beitr. z. Käferfauna Ins. Jesso, p. 69; Bates, Trans. Ent. Soc. Lond., 1873, p. 261.

Von Harold identified this species from a type-specimen received from Motschulsky himself, and a small

example of *H. japonicus*, which I sent to Baron Chaudoir, was returned by him as "*H. rugicollis*, Mots., comparé à un type." Notwithstanding, therefore, the insufficiency of Motschulsky's description, there is no longer room for doubting that the species formerly determined by me as *japonicus* is the same as *rugicollis*.

Harpalus congruus, Motschulsky.

Motschulsky, Bull. Mosc., 1866, i., p. 164.

H. lævicollis, Morawitz, Beitr. z. Käferfauna Ins. Jesso, p. 71 (nec Dufts.); Bates, Trans. Ent. Soc. Lond., 1873, p. 261.

Tachycellus falsus, Bates, Trans. Ent. Soc. Lond., 1876, p. 3.

T. congruus, Harold, Deutsche Ent. Zeitschr., 1877, p. 338.

Appears to be generally distributed throughout Japan. Von Harold had reason in doubting that the species belonged to *Tachycellus*: on examining the penultimate joint of the labial palpi I find that it is multisetose, like all the true *Harpalinæ*, and not bisetose, as in the *Stenolophinæ*, to which *Tachycellus* belongs. It remains to be decided whether the fine oblique impressed line on each side of the forehead, extending from the frontal fovea to the eye, is a character of sufficient importance to separate the species generically from *Harpalus*. Many of the smaller species of *Ophonus* present traces of the same character, and in *Harpalus lævicollis*, which *H. congruus* so closely resembles, it appears to be present in some examples and absent in others.

Harpalus leptopus.

H. congruo proxime affinis sed major, antennis pedibusque longioribus. Elongato-oblongo-ovatus, piceus, ænescens vel cuprascens, politus, antennis partibus oris pedibusque testaceo-rufis; thorace quadrato-cordato, antice rotundato postice longe sinuatim angustato, angulis posticis acutis, margine basali medio recto, versus angulum utrinque retrorsum obliquo, supra punctulato-rugosis disco lævi, fovea elongata modice impressa; elytris apice oblique sinuatis, acute striatis, interstitiis

modice convexis 3io unipunctato, corpore subtus lævi. Long. 9½—10 mm., ♂, ♀.

Nikko, borders of the snow; Nakano toge, Koyebori.

The head, as in *H. congruus*, is smooth, with a fine oblique impressed line from the frontal fovea on each side to the eye. The thorax is relatively longer and moderately narrowed and sinuated behind, and the hind angles strongly acute.

Harpalus discrepans, Morawitz.

Morawitz, Beitr. z. Käferfauna Ins. Jesso, p. 70.

Niigata, Hakodate, Bukenji, and Yokohama.

Variat; pedibus fulvo-testaceis tibiis plus minusve infuscatis.

Motschulsky (Bull. Mosc., 1863, iv., p. 214) says this species is his *H.* (*Pheuginus*) *corporosus*. This must either be a mistake or Motschulsky has given a false description of his *H. corporosus*, for he says of the elytra, "subtiliter crenato- vel cancellato-punctatis," which does not apply to *H. discrepans*, but suits very well the following species found in the same localities:—

Harpalus corporosus, Motschulsky.

Motschulsky, Etud. Ent., x., 1861, p. 3; *H. zabroïdes*, Dejean, var.; Morawitz, Beitr. z. Käferfauna Ins. Jesso, p. 71.

Sapporo, Shiraoi, Awomori.

A large robust species, varying in size from 11 mm. to 15 mm. Morawitz, who had only one example before him (taken at Hakodate), mentions the crenated striæ as the only character distinguishing it from the European *H. zabroïdes*. He might have added the punctured base of the thorax, which is constant in all the numerous examples I have seen.

Harpalus chlorizans.

H. zabroidi et *H. corporoso* affinis sed differt thorace postice rotundato-angustato, angulis posticis apice rotundatis. Oblongus, crassus, niger, thorace basi margineque elytrisque olivaceo-æneis, palpis apice tantum

rufis, antennis pedibusque (tarsis inclusis) nigro-piceis ; thorace valde transverso, lateribus fere regulariter et leviter arcuatis, basi et margine laterali crebre rugulosopunctulatis ; elytris (mas) valde convexis apice oblique sinuatis, crenato-striatis interstitiis planis. Long. $12\frac{1}{2}$ mm., ♂ .

Yokohama ; one example.

This is apparently only a local or colour-variety of a species not uncommon in Eastern China and Korea, which is generally of a deep black colour.*

Harpalus fuliginosus, Dufts.

Dufts., Morawitz, Beitr. z. Käferfauna Ins. Jesso, p. 71.

Near the snow on Niohozan.

Morawitz's specimens were from the Komanotake. Mr. Lewis' specimens agree very well with the European form ; von Harold appears to have been wrong in referring the species determined by Morawitz to *H. flavitarsis*.

Harpalus flavitarsis, Dejean.

Dejean, Sp. Gen., iv., 378 ; Harold, Deutsche Ent. Zeitschr., 1878, p. 66.

Tokio (*Hilgendorf*).

An example from Junsai (var. *niponensis*) agrees with the description, except in its much larger size, $4\frac{1}{2}$ lin., the European *H. flavitarsis* being $2\frac{1}{2}$—3 lin.

Harpalus variipes.

H. anxio et *Frolichii* similis. Differt corpore angustiori, thoracisque lateribus fere regulariter arcuatis. Subanguste oblongo-ovatus, piceo-niger, elytris æneotinctis, antennis palpis tibiis et tarsis melleo-fulvis, tibiis 4 posticis apice infuscatis. Capite parvo, lævi, foveis frontalibus punctiformibus ; thorace elytris haud angustiori, lateribus arcuatis antice paullo citius quam postice

* It is apparently undescribed :—*Harpalus crates* : *H. chlorizanti* quoad formam et sculpturam simillimus ; oblongus, crassus, sat convexus, niger nitidus, interdum leviter æneo tinctus ; thorace valde transverso lateribus fere regulariter et leviter arcuatis, basi subconfluenter grosse punctato ; elytris profunde crenato-striatis. Long. 12—13 mm. Korea ; Kiu-Kiang ; Hong-Kong.

angustato, angulis posticis obtusis subrotundatis, fovea utrinque basali oblonga parce punctata, marginibus lateralibus rufescentibus; elytris apice parum oblique sinuatis, acute subpunctulatim striatis, interstitiis subplanis, tertio impunctato. Long. 7½ mm., ♂, ♀.

Yokohama, on the beach; common in March at Honmoku.

It is with great hesitation I venture to describe this species as new; it approaches so closely several of the smaller European species, with all of which I have been able to compare it, except with *H. flavicornis*. The form of the thorax, however, seems to be different from that of all the species alluded to, the sides being arcuated, without trace of straightening towards the hind angles, and the curvature being notably strong from the middle to the anterior angles.

Iridessus, n. g.

Gen. *Harpalo* quoad formam simillimus sed subfam. *Stenolophinæ* pertinet, palpis labialibus articulo penultimo bisetoso. Caput læve, foveis frontalibus vagis, vix impressis, linea subtile utrinque inter foveam et oculum interrupta. Mentum sinu acute dentato. Thorax relative magnus, quadratus, elytris haud angustior. Mas, tarsi anteriores quatuor sicut in *Harpalis* dilatati, articulo quarto cordato nullomodo bilobato.

Iridessus lucidus.

Harpalus lucidus, Morawitz, Beitr. z. Käferfauna Ins. Jesso, p. 72.

Widely distributed, but not abundant. Hakone Lake to Sapporo.

Iridessus relucens.

Harpalus relucens, Bates, Trans. Ent. Soc. Lond., 1873, p. 264.

The impressed oblique frontal line is entire in this species.

Stenolophus connotatus, Bates.

Bates, Trans. Ent. Soc. Lond., 1873, p. 327.

Hitherto known only from China. Mr. Lewis met with it abundantly at Niigata and Awomori.

Stenolophus propinquus, Morawitz.

Morawitz, *l. c.*, p. 80.

Throughout Japan. Common from Yokohama to Hakodate.

Stenolophus agonoïdes.

S. vespertino, *proximo*, etc., affinissimus, set differt corpore (præcipue elytris) longiori, thoraceque postice gradatim sed valde angustato, angulis posticis distinctis sed obtusis ; piceo-niger, antennarum articulis 2 basalibus, palpis, margine laterali thoracis pedibusque testaceo-rufis, labro marginibus mandibulisque basi rufis ; thorace basi utrinque fovea lata sparsim grosse punctata, angulis distincte reflexo-marginatis ; elytris chalybeato-iridescentibus, margine posteriori rufo, acute striatis, interstitiis versus apicem angustioribus et convexioribus. Long. 6½ mm.

Niigata.

Acupalpus marginatus, Lucas.

Lucas, Explor. Alger. Ins., p. 75.

Hakodate and Otaru, in South Yezo.

Two examples, closely resembling others from Algiers and European Turkey, with which I have compared them. Piochard de la Brulerie considered *A. marginatus* to be only a variety of the common European species, *A. dorsalis*, F.

Bradytus macros.

B. ampliato major præcipue longior ; magnus, gen. *Curtonoto* simillimus, oblongus, piceo-fuscus vel niger vix æneo-tinctus, antennis, palpis, thoracis margine laterali pedibusque plus minusve piceo-rufis ; capite thoraceque coriaceis, hoc confluenter punctulato (disco læviori) quam in *B. ampliato* longiori, prope basin modice angustato, lateribus medio valde rotundatis, basin versus rectis, angulis posticis subacutis, margine basali utrinque late sinuato, fovea basali utrinque lata haud profunda, carinula parum elevata ; elytris crenato-striatis ; tibiis anticis extus apice late angulato-productis, margine pluri-spinoso, subserrato. Mas, tibiis posticis intus pilis mollibus perpaucis vestitis. Long. 11 mm., ♂, ♀ :

All the islands ; under stones in river-beds.

Facies of the genus *Curtonotus*, but differs in the simple structure of the intermediate tibiæ of the male. The soft hairs on the hind tibiæ of the same sex are only three or four in number, and scarcely visible among the spines, but this character suffices to bring the species within the definition of the genus *Bradytus*, where it seems less out of place than in *Leiocnemis*.

Amara Zimmermanni, Putzeys.

Putzeys, Ann. Soc. Ent. Belg., xviii., p. 7.

Nagasaki; Kioto.

Amara striatella, Putzeys.

Putzeys, Ann. Soc. Ent. Belg., xviii., p. 8.

Nagasaki; Kioto.

Specimens (male) of *A. chalcites*, Zim., and *A. Zimmermanni*, Putz., received by Mr. Lewis from Putzeys himself and agreeing with his descriptions, seem to me only varieties of one and the same species, all gradations being found in the extensive series collected by Mr. Lewis.

A. striatella, doubtfully separated by Putzeys himself, is clearly only a slight variation, common enough in this genus, in which the striæ are less deeply impressed.

Amara obscuripes, Bates.

Bates, Trans. Ent. Soc. Lond., 1873, p. 294.

Nagasaki, on the mountains; rare. Ashinoyu; abundant.

Morio Japonicus.

M. orientali, Dej., proxime affinis, vel ejus varietas geographica; differt solum elytrorum interstitiis prope suturam subconvexis. Long. 17 mm.

Kiushiu; under fir-bark at Konose and Yuyama.

In its somewhat greater size this species approaches nearest the form of *M. orientalis* found in the Andaman Islands. *M. orientalis* is an apparently common species throughout the whole Indo-Malayan region, and varies considerably in different localities. I have seen no

variety in which the interstices are nearly equally convex throughout the elytra, near the suture as well as on the sides, as they are in *M. Japonicus*.

Trigonognatha cuprescens, Motschulsky.

Motschulsky, Etud. Ent., 1857, p. 26.

Nikko, Kashiwagi, and Sado. Motschulsky's specimen was from Simoda.

Chaudoir erroneously referred this genus to *Triplogenius*. It is widely distinct from the subgroup to which *Triplogenius* belongs, and in fact is much nearer *Myas*, the North-American species of which it much resembles.* The mentum is deeply emarginated, with a broad truncated tooth; the labial palpi have the penultimate joint bisetose. Mr. Lewis' specimen does not very well agree with Motschulsky's description, though I agree with him in thinking it very likely belongs to the same species. It is scarcely depressed, and the elytral striæ are distinctly punctulated, not "impunctatis."

Trigonognatha aurescens.

Minor, nigra, collo, thorace elytrisque splendide æneis, subauratis, marginibus iridescentibus, palpis apice rufis; thorace quadrato, antice leviter rotundato, postice gradatim, modice, sinuato-angustato, angulis posticis rectis, margine incrassato, laterali postice crenato, basi depresso foveaque utrinque magna profunda extus (ante angulum) carina margini parallela delimitata; elytris convexis profunde striatis, striis punctulatis. Long. 15 mm., ♂, ♀.

Niohozan, under stones, October; and one example from Chiuzenji.

* The North-American species, *Myas coracinus*, Say, and *foveatus*, Lec., are much nearer, in the form of the thorax, tooth of the mentum, and in their submoniliform antennæ, to *Trigonognatha* than to *Myas*. The following is a magnificent species of the same genus from China, not yet described:—*Trigonognatha princeps*. Maxima, oblonga, lata, nigra, thorace margine purpureo, elytris igneo-cupreis, marginibus viridi-auratis; thorace transverso, subcordato-quadrato, postice modice sinuato-angustato; angulis rectis, fovea basali utrinque angusta, profunda, extus carina obtusa marginata; elytris subtilissime rugulosis nec politis, striis fundo punctulatis, interstitiis valde convexis; ante apicem abrupte et valde emarginatis (mas); corpore subtus impunctato. Long. 33 mm. Prov. Quang-tung, China.

Allotriopus hoplites.

Oblongus, gracilis, castaneo-fuscus, partibus oris pedibusque castaneo-rufis; capite fere sicut in *Hypherpe*, angusto, sed oculis paullo magis prominentibus; thorace elongato mox pone apicem dilatato, deinde usque ad basin angustato, angulis posticis obtusis sed apice dentiformibus, foveis basalibus linearibus utrinque duabus, profundis, lævibus; elytris punctulato-striatis, interstitiis convexis tertio postice unipunctato, humeris exstantibus dentatis; sternis ventrisque basi utrinque valde punctatis.

♂. Femora postica subtus medio obtuse dentata basi sinuata, trochanteribus elongatis; tibiæ intus serratæ. Long. 8—10 mm.

Chiuzenji and Oyayama, and other places of similar elevation, in rotten trees or under old timber.

Belongs to the genus *Allotriopus*, of which only one species has yet been described, from Mexico. It differs from the Mexican species in the hind tibiæ being straight, not bowed, and in the femora being dilated and toothed beneath in the male. *Allotriopus* agrees with *Pterostichus* in its short metathoracic episterna.

Hypherpes colonus.

H. castanipedi affinis, sed magis linearis. Elongatus, angustus, nigro-piceus, antennis palpis et pedibus rufo-castaneis; capite angusto, post oculos paullulum prominentes gradatim angustato; thorace elytris angustiori elongato-ovato, sat convexo, prope basin angustato ibique lateribus rectis, angulis posticis subacutis, fovea basali utrinque oblonga, profunda punctata; elytris punctato-striatis, interstitiis sat convexis, striola scutellari obsoleta ibique puncto ocellato; sternis utrinque grosse punctatis, episterno metathoracico curto sed angusto; femoribus validis. Long 12 mm., ♂.

Oyayama; one example from an old beech in April.

Belongs to *Hypherpes* by the absence of punctures from the 3rd elytral interstice. It is also not unlike in facies the narrower and more convex species of the genus, e. g., *H. castanipes*, differing in the relatively longer and more convex thorax.

Pterostichus macrogenys.

Elongatus, parallelopipedus, parum convexus, niger, palpis pedibusque castaneo-rufis, capite magno, genis tumidis post oculos maxime prolongatis, oculis parvis; mandibulis valde elongatis; thorace cordato-quadrato, angulis anticis productis et acutissimis, postice longe sinuatim sed parum angustato, angulis posticis acutis, fovea utrinque basali magna et profunda, sublævi, margine basali medio profunde sinuato versus angulum rotundato; elytris apice vix sinuatis humeris haud productis, punctulato-striatis, interstitiis parum convexis tertio bi- vel tri-punctato; corpore subtus lævi.

♂. Segmentum ultimum ventrale fovea magna et profundo medio longitudinaliter vix elevata, margine apicale reflexo medio indentato. Long. 23 mm., ♂, ♀.

Niohozan; one male and one female under a stone in the deep forest, June, 1880.

Pterostichus pachinus.

Elongatus, modice convexus, niger palpis pedibusque castaneo-rufis; capite subcrasso, ovato, genis parum tumidis, post oculos (sat convexos) paullo elongatis; thorace cordato, prope basin valde angustato et sinuato, angulis posticis rectis subacutis, anticis vix productis, fovea basali utrinque angusta, lineari; elytris apice oblique sinuatis, exarato-punctulato-striatis, interstitio tertio quadripunctato.

♂. Segmentum ultimum ventrale apice latum haud profunde foveatum, fovea medio paullo elevata, margine apicale haud reflexo. Long. 20 mm.

Junsai.

Allied to *P. sphodriformii*, Bates; but broader and more robust in all its parts, and further distinguished by the different form of the apical ventral segment in the male.

Pterostichus asymmetricus.

P. truncato (Dej.) subsimilis, sed magis robustus et genis post oculos elongatis et tumidis. Elongatus, niger, palpis et tarsis castaneo-rufis; capite subtriangulare, post oculos (parum convexos) tumido et dilatato, juxta collum subito constricto; thorace cordato, paullo post

medium valde sinuato-angustato, angulis posticis acutis, anticis haud productis, fovea utrinque basali lineari, sat profunda vage punctata; elytris elongato-ovatis, apice distincte sinuatis, sat profunde striatis, interstitio tertio 3—5 punctato. Long. 16 mm.

♂. Segmentum ultimum ventrale haud symmetricum; transverse profunde excavatum, margine apicale elevato inæqualiter bisinuato, medio processo subbifido armato.

♀. Segmentum ultimum ventrale latissimum.

Under stones on the margins of Junsai and Chiuzenji Lakes.

Pterostichus spiculifer.

P. impressicolli (Chaud.) similis. Oblongus subgracilis, parum convexus, niger, elytris iridescentibus, antennis palpis pedibusque rufo-piceis; capite quam in *P. impressicolli* post oculos magis tumido, juxta collum subito angustato; thorace cordato-quadrato, antice valde rotundato postice sinuato-angustato, angulis posticis rectis, fere acutis, elevatis, fovea utrinque lineaque dorsali profundissimis; elytris apice parum sinuatis, profunde striatis, interstitio tertio 4 punctato.

♂. Segmentum ultimum ventrale fovea lata profundissima irregulari margineque apicali medio spina longa armato. Long. 13 mm., ♂, ♀.

Nikko.

Resembles closely *P. impressicollis*, Chaud., of Northern Italy; but, besides the difference in the armature of the apical ventral segment of the male, it is distinguished by the long tumour behind the eyes, which is not narrowed, except at the neck, and there somewhat abruptly; also by the smaller interstitial punctures of the elytra, and more or less dull pitchy-red colour of legs, palpi, and antennæ.

Pterostichus mirificus.

P. truncato similis, paullo gracilior et magis convexus; niger nitidus, palpis et tarsis rufis, antennis piceo-rufis; capite fere sicut in *P. truncato*, genis post oculos convexos vix tumidis; thorace gracilius cordato, post medium magis angustato; angulis posticis rectis, paullulum exstantibus, fovea basali lineari, profunda, lævi; elytris convexis profunde striatis, interstitiis convexis, tertio 4-punctato.

♂. Segmentum ultimum ventrale transverse profunde excavatum, margine apicali medio late sinuatum angulis valde lobatis, lobis cornua recurva simulantibus. Long. 15 mm., ♂, ♀.

Awomori.

The apical ventral segment of the male is quite as extraordinary in form as in *P. asymmetricus*, but is symmetrical. Instead of a central subbifid lobe, the apical margin is broadly sinuated in the middle, with each of the external angles produced into a horn-like process, which curve upwards towards the tips of the elytra, and are visible from above.

Pterostichus (*Omaseus?*) *polygenus.*

Parvus, nigro-piceus, antennis palpis pedibusque castaneo-rufis; oculis prominentibus; thorace subcordato-quadrato, paullo ante medium sat rotundato postice paullo magis quam antice (et subrecte) angustato, angulis anticis parum productis, posticis dentiformiter prominentibus, margine laterali sat acute reflexo, intus sulculo angusto a disco separato, basi utrinque striis duabus profundis grossissime punctatis et carinula lævi prope angulum; elytris oblongo-ovatis, margine basali sat recto ad humerum denticulato, apice conjunctim sat acute prolongatis, profunde punctato-striatis striola scutellari brevissima (interdum obsoleta), interstitio tertio bipunctato; sternis utrinque (mesosternique pedunculo) grosse punctatis; metathoracis episternis ut in *Omaseis* sat brevibus postice angustatis; tarsis 4 posticis lateraliter tenuiter sulcatis; prosterni processu apice indistincte marginato. Long. 8 mm., ♂, ♀.

Nikko.

Closely allied to *P.* (*Omaeus*) *thorectes*, differing only in the thorax being much shorter, less regularly arcuated on the sides, and with a much narrower groove between the reflexed lateral margins and the disk. The two species form a distinct group closely allied to *P.* (*Lagarus*) *nimbatus* and *Solskyi*.

Pterostichus Thunbergi, Morawitz.

Morawitz, Bull. Acad. St. Petersb., v., 1863, p. 328; Bates, Trans. Ent. Soc. Lond., 1873, p. 289.

Yezo.

The metathoracic episterna are rather longer and narrower than they are in the restricted genus *Pterostichus* or in *Steropus*. They are nearly of the same shape as in *Omaseus*, but the general form and facies of the species do not agree with that group.

Pterostichus sejunctus.

P. Thunbergi simillimus, differt tantum thoracis angulis posticis acutis productis, margine ante angulum breviter sinuato; sternis ventrisque basi utrinque plus minusve punctatis. Long. 15 mm., ♂, ♀.

Yezo.

Distinguishable from *P. Thunbergi* only by the prominent and acute posterior angles of the thorax; but specimens of *P. Thunbergi* occur in which the angles have a slight projection. The punctuation of the sides of the sternum and basal segments of the abdomen is also not quite constant; though generally smooth in *P. Thunbergi*, examples occur in which they present numerous punctures.

Pterostichus (Omaseus?) defossus.

Platysmæ oblongopunctatæ primâ facie similis, sed differt thoracis angulis rotundatis metathoracisque episternis parum elongatis, &c. Niger supra plus minusve olivaceo-æneseens, antennis palpis pedibusque piceis; oculis sat prominentibus, fronte punctulata; thorace paullo ante medium valde rotundato, postice subrecte angustato, angulis posticis rotundatis, foveis basalibus utrinque duabus profundis et grosse punctatis, interiori longiori et profundiori; elytris oblongo-ovatis, margine basali utrinque valde arcuato, apice oblique modice sinuatis, sat profunde striatis (stria 7ma apice excepta obsoleta) striola scutellari modice elongata, interstitiis convexis, tertio 2—3 punctato; tarsis 4 posticis gracilibus, bisulcatis; sternis lateraliter modice punctatis, metathoracis episternis fere sicut in *Omaseo* modice elongatis.

♂. Segmentum ultimum ventrale simplex. Long. $8\frac{1}{2}$—10 mm., ♂, ♀.

Nikko.

Pterostichus (*Omaseus*) *prolongatus*; *P.* (*Lyperus*) id., Morawitz.

Morawitz, Bull. Acad. St. Petersb. v., 1862, p. 251.

P. (*Steropus*) *tropidurus*, Bates, Trans. Ent. Soc. Lond., 1873, p. 288.

Omaseus Japonicus, Motschulsky, Etud. Ent., 1860, p. 6?

The typical form of this species has perfectly flat elytral interstices, and the elytra are elongate-oblong.

East Siberia; Shanghai; Yezo.

Var. Elytrius profundius striatis, interstitiis convexis.

Pterostichus (*Lyperus*) *fuligineus*, Morawitz, Bull. Acad. St. Petersb., v., 1862, p. 325; id., Beitr. z. Kaferfauna Ins. Jesso, p. 52.

Yezo, and the main island.

A series of this variety taken by Mr. Lewis exhibits various degrees of convexity of the elytral interstices. Examples from Fujisan form the extremes in this respect, and have the *prima facie* aspect of a distinct species; the elytra are relatively shorter and dilated posteriorly; but this modification is seen in Yezo specimens of *O. prolongatus*.

The metathoracic episterna are too narrow and elongated for *Steropus*, although the facies of the insect is that of the species of *Steropus* allied to *S. orientalis*. I hesitate to adopt Motschulsky's prior name *japonicus*, as the size he gives (4½ lines) and the insufficient diagnosis make the identity of the species doubtful.

Pterostichus (*Omaseus*) *leptis*.

O. nigro affinis, sed gracilior thorace precipue angustiori prope basin fortius sinuato-angustato, angulis posticis rectis subacutis. Niger, palpis castaneo-rufis, antennis tarsisque piceis; capite punctulato, oculis prominentibus; thorace basi utrinque crebre rugulosopunctato, profunde foveato, bistriato, carinulaque obtusa juxta angulum; elytris profunde subpunctulato-striatis. Long. 20 mm., ♂, ♀.

Sapporo, Hakodate, Niigata, and Fujita.

The prosternal process is margined at the apex, but sometimes very faintly. It is distinctly margined in many other species of the group, e. g., *O. fortis*, *Eschscholtzi*, &c.

Pterostichus (*Omaseus*) *ambigenus*.

O. nigritæ haud dissimilis sed thorace fere ut in *Platysma vitrea* postice magis quam antice angustato, lateribus valde arcuatis, angulis posticis breviter prominentibus acutis. Niger leviter æneo-tinctus; capite mox pone oculos prominentes angustato, foveis frontalibus tenuibus vix impressis; thoracis fovea basali utrinque lata et profunda, punctata, bistriata, carinulaque lævi juxta angulum; elytris apice sat valde sinuatis, punctulato-striatis, interstitiis modice convexis, tertio punctis 3 vel 4.

♂. Segmentum ultimum ventrale modice concavum, antice tuberculum triangulari incumbente, depressum, apice tantum libro. Long. 11 mm., ♂.

Shimidzu-togé. One example in August.

Platysma oblongopunctata, Fab.

Fab. Syst. El., i., 183.

Nikko. Two examples, not differing from specimens from Eastern Europe.

Lagarus nimbatus, Morawitz.

Morawitz, Bull. Acad. St. Petersb. 1862, p. 235.

Argutor? microcephalus, Motschulsky, Etud. Ent., ix., 1860, p. 6?

Lagarus microcephalus, Bates, Trans. Ent. Soc. Lond., 1873, p. 285.

Generally distributed throughout Japan.

Chaudoir (Bull. Mosc., 1878, p. 60) has given valid reasons for rejecting the name of *A. microcephalus* for this species. There is not much in the specific description above cited to forbid the supposition that it refers to the species; but in a subsequent paper, in which Motschulsky proposed and defined a genus for the reception of his *A. microcephalus*, genus *Rhagadus*, Bull. Mosc., 1865, iv.,

p. 261, characters are adduced which are quite inapplicable to the species. They are possibly only blunders, and the species may be the same; but it is safer to reject the name altogether.

Lagarus nimbatidius; *Feronia* (?) *nimbatidia*, Chaudoir.

Chaudoir, Bull. Mosc., 1878, p. 63.

Japan.

Said to be very near *L. nimbatus*, differing in the more rounded sides and hind angles of the thorax. In *L. nimbatus* the hind angles are always distinct, and sometimes projecting; but they vary, and I doubt whether *L. nimbatidius* is more than one of the varieties.

Lagarus sulcitarsis, Morawitz.

Morawitz, Bull. Acad. St. Petersb., v., p. 250.

Hakodate; also at Fukui, in the main island.

Lagarus dulcis.

L. sulcitarsi proxime affinis et similis; major et latiori, niger subopalescens, politus, antennis palpis et pedibus piceis; capite ovato, post oculos sat prominentes recte angustato; thorace relative magno convexo, quadrato lateribus fere regulariter arcuatis (antice magis quam postice angustato) angulis anticis vix productis, posticis omnino rotundatis, margine laterali tenui usque ad medium basin continuato, supra basi utrinque fere plano, punctulato, linea elongata recta (a margine distante) impressa; elytris elongato-oblongis punctulato-striatis, interstitiis planis, tertio tripunctato; tarsis 4 posticis bisulcatis.

♂. Segmentum ultimum ventrale simplex. Long. 10 mm., ♂, ♀.

Ogura Lake, in reed-refuse.

Pœcilus encopoleus, Solsky.

Solsky, Horæ Soc. Ent. Ross., ix., 4, p. 306; Harold, Deutsche Ent. Zeitschr., 1877, p. 339.

Pœcilus planicollis, Motsch., Etud. Ent., 1860, p. 5 (?); Bates, Trans. Ent. Soc. Lond., 1873, p. 284.

Generally distributed throughout Japan.

All the examples of *Pœcilus* of the *cupreus* group taken by Mr. Lewis have three basal joints of the antennæ red.

As Motschulsky gives two joints only as red in *planicollis*, Harold rightly rejects his name for the species, to which his description in other respects applies.

Pœcilus fortipes, Chaudoir.

Chaudoir, Bull. Mosc., 1850, iii., p. 131; id. ibid., 1863, i., p. 222; id., Abeille, 1869, p. 234; Putzeys, Ann. Soc. Ent. Belg., xviii., 1875, p. 7. *Pœcilus lepidus*, Fab. var., Moraw., Beitr. z. Kaferfauna Ins. Jesso, p. 45.

Mr. Lewis has brought home a large series of this species, which I find agree with East Siberian examples in the structural differences which separate the species from the European *P. lepidus*. It is a much larger and more robust insect, and in all its varieties distinguishable by the sides of the thorax falling obliquely on the base, thus forming an obtuse angle, instead of being sinuated as in *P. lepidus*.

Pœcilus prolixus, Putzeys.

Putzeys, Ann. Soc. Ent. Belg., xviii., 1875, p. 10. *Pœcilus Koyi*, id. olim (nec Germar.).

Yezo.

Differs from *P. fortipes* apparently only in the sides of the thorax being regularly arcuated. I have East Siberian varieties of *P. fortipes* which answer to this description, but have failed to detect any in Mr. Lewis's series from Yezo.

Stomis prognathus.

Piceo-niger elytris opalescentibus, palpis fulvis, antennis pedibusque plus minusve rufo-piceis; mandibulis et palpis quam in *S. pumicato* multo magis elongatis, labro profunde et late emarginato, capite post oculos transversim depresso; thorace cordato, ante medium valde rotundato, post medium sinuato-angustato angulis posticis rectis, basi utrinque grosse punctato profunde unistriato; elytris subelongato-ovatis, juxta basin cite angustatis, angulo humerali dentiformi, punctulato-striatis; sternis ventrisque basi grosse punctatis. Long. 10 mm., ♂, ♀.

Hakone and Chiuzenji, in shady *Cryptomeria* forests.

Agrees with *Stomis pumicatus* in all essential points of structure, but very much larger and of different facies, owing to its more ovate form, and especially to its thorax being dilated and rounded more in front, and strongly sinuated and narrowed behind. The mandibles are greatly elongated in both sexes, the palpi long and linear, and the antennæ relatively much longer than in *S. pumicatus*.

EUCALATHUS, n. g.

Gen. *Calatho* affinis; corpus elongatum, gracile, thorace elytris multo angustiori, elongato-quadrato. Mentum dente acute bifido. Palpi graciles, articulis terminalibus apice attenuatis. Antennæ elongatæ gracillimæ, articulo tertio quarto vix longiori. Prosternum apice haud marginatum, apice verticaliter acute carinato. Metasterni episterna brevia. Elytra apice haud perspicue sinuata, sat profunde striata, interstitio tertio bipunctato. Tarsi 4 posteriores subtus longe et dense pilosi, supra glabri, articulis 1 et 2 utrinque unisulcatis; ungues (prope apicem excepto) acute denticulatæ; mas articulis 1—3 elongato-triangularibus.

The facies of the two species known of this genus are quite different from the *Calathi*, even from such aberrant forms as *C. Solieri* and *C. Deyrollei*. From the true *Calathi* they also differ in the densely hairy soles of the four hind tarsi and the unmargined apex of the prosternum, characters which are presented by *Pristosia picea*, but associated with features foreign to *Eucalathus*, such as the short triangular form of the dilated tarsi, the obsolete tarsal grooves and the impunctate 3rd elytral interstice. I think it likely that the East Siberian *Calathus nitidulus* (Mor.) belongs to *Eucalathus*.

Eucalathus æneolus.

Pristonychus æneolus, Bates, Trans. Ent. Soc. Lond., 1873, p. 272.

Hiogo; Nikko, Miyanoshita; Fukushima; Wada togé.

A handsome species, resembling in form the slenderer species of *Pristonychus*, but of olive-green colour, sometimes rich golden olive, and highly polished. It varies in size from 12 to 16 mm. A specimen from Nikko has the thorax much narrowed and sinuated near the base.

Eucalathus colpodoïdes.

E. æneolo multo minor et gracilior. Æneo-niger, antennis, palpis, tarsis (interdum tibiis) et trochanteribus fulvo-rufis, elytris viridi- vel cupreo-auratis fere sicut in *Calatho metallico*; capite ovato, post oculos haud tumido, collo supra transversim depresso; thorace quadrato antice perparum rotundato, postice modice et recte angustato, angulis posticis rotundatis, basi medio late sinuato, margine laterali vix perspicue incrassato, valde reflexo, fovea utrinque basali magno et profundo; elytris basi angustis, margine basali valde arcuato, humero haud producto, punctulato-striatis, striola scutellari sat elongata. Long. 11—12 mm., ♂, ♀.

Nikko, Nantaizan and Niohozan.

At first sight resembles the metallic species of *Colpodes*; but the colour is of different lustre from that seen in any species of *Colpodes*, and nearest resembles that of the European *Calathus metallicus*.

Crepidactyla melantho.

C. nitida minor et gracilior; nigra, antennis palpis tibiis et tarsis fulvo-rufis vel piceo-rufis; thorace relative parvo, quadrato postice paullo magis quam antice angustato, lateribus modice arcuatis, margine reflexo, angulis obtusis rotundatis, medio basi sinuato, fovea utrinque basali lata et profunda; elytris elongato-ovatis, prope basin angustatis, humeris obliquatis, profunde striatis, interstitiis convexis tertio bi- vel tripunctato; tarsi 4 posterioribus utrinque bisulcatis. Palpi labiales mas et fœm. securiformes; apice oblique truncati (♂) angulo exteriore acutissimo; maxillares subcylindrici, truncati. Long. 12 mm., ♂, ♀.

Sapporo.

The male labial palpi differ from those of *Pristodactyla cyclodera* in having their outer apical angle prolonged and acute. If *Pristodactyla* be limited to those species in which the terminal joints of the palpi are cylindrical (though truncated), *P. cyclodera* must be removed to *Crepidactyla*, which genus again is scarcely to be distinguished from *Taphria*, the only structural difference being the more developed grooves of the posterior tarsi.

TREPHIONUS, n. g.

Gen. *Calatho* affine; sed differt unguibus simplicibus, &c. Corpus fere sicut in *Anchomeno*, gracile. Caput angustum; oculi haud prominentes; palpi sicut in *Calathis* subgraciles, fere cylindrici apice breviter truncati; mentum dente mediano apice emarginato. Thorax oblongo-cordatus, postice modice angustatus, lateribus ante angulos basales brevissime sinuatis, angulis ipsis (cum margine basali) rotundatis. Elytra apice integra, interstitio tertio impunctato. Prosternum apice haud marginatum. Metathoracis episterna sat brevia postice parum angustata. Tarsi supra glabri subtus sparsim setosi, 4 posteriores articulis 1—4 utrinque sulcati et supra subtiliter alutacei medioque excavati; maris anteriores articulis 3 breviter triangularibus. Ungues simplices.

A genus having a superficial resemblance to the *Anchomeni*, but with a form of thorax closely resembling that of the *Calathi* and *Pristodactylæ*, especially of the species in which it is narrowed behind, with the hind angles broadly rounded, and forming a curve with the basal margin. The sinuation of the sides just before the posterior angle is unlike anything I have seen in *Calathus*, and most nearly approaches the form presented by certain species of *Pristonychus*, to which genus *Trephionus* approximates also in the form of the head and the impunctate 3rd elytral interstice.

Trephionus Nikkoensis.

Gracilis, castaneo-fuscus nitidus, antennis partibus oris pedibusque castaneo- vel piceo-rufis; capite angusto, lævi, foveis frontalibus parum impressis; thorace oblongo-subcordato, postice modice angustato, lateribus ante angulum posticum sinuatis, puncto setifero longe ante angulum basalem sito, angulis late (cum margine basali) rotundatis, fovea utrinque basali sat profunda lævi; elytris oblongo-ovatis sat profunde striatis, stria scutellari modice elongata, interstitiis omnibus impunctatis. Long. 9 mm., ♂, ♀.

Nikko; Nantaizan. Damp forests in shady places.

Anchomenus (*Limodromus*) *subovatus*, Putzeys.

Putzeys, Ann. Soc. Ent. Belg., xviii. (1875), p. 6.

North Nipon (*Putz.*). Chiuzenji (*Lewis*).

Anchomenus (*Platynus*) *xestus*.

A. scrobiculato affinis. Depressus, niger politissimus, elytris opalescentibus ; antennis palpis, pedibus (femoribus nigris exceptis) fulvo-piceis ; capite post oculos minus prominentes elongato-tumido (fere sicut in *P. complanato*) gradatim usque ad collum angustato, collo supra depresso ; thorace fere ut in *A. scrobiculato* quadrato-cordato, postice sat sinuato-angustato, angulis posticis rectis, fovea basali magna profunda lævi ; elytris ovatis margine laterali sat explanato-reflexo, apice perparum sinuatis, striatis, striis haud perspicue punctulatis, interstitiis paullo convexis, tertio 3-punctato ; metathoracis episternis quam in *A. scrobiculato* paullo longioribus ; tarsis posterioribus valde sulcatis. Long. 10 mm.

Nikko.

Anchomenus calleides.

A. cyaneo (Dej.) proxime affinis ; major et robustior, elytrisque ad suturam magis prolongatis margineque fortius sinuato. Cyaneus vel olivaceo-viridis ; thorace relative parvo, quadrato, subcordato, postice (longe ultra medium) sinuato-angustato, angulis posticis rectis, supra transversim rugoso, basi omnino scabroso-punctato ; elytris oblongo-quadratis, apice ad suturam paullo depressis, prolongatis extus sinuatis, dorso exarato-striatis striis punctulatis ; tarsorum articulo quarto sat profunde emarginato. Long. 11 mm., ♂, ♀.

Morioka and Midzusawa. Under stones in the Kitakamigawa.

Extremely near the South European *A. cyaneus*, but rather larger and more robust, the thorax a little more sinuate and narrowed at the base, and the elytra prolonged at the sutural apex with more distinct ante-apical sinuation. The 1st ventral segment has a few punctures on each side.

Anchomenus leucopus, Bates.

Bates, Trans. Ent. Soc. Lond., 1873, p. 279.

Niigata, Awomori, and Shimonosuwa are additional localities for this elegant species,* which belongs to the same group as *A. cyaneus*, *calleides*, &c. The prosternum and metasternum are rather strongly punctured.

Anchomenus (*Agonum*) *sculptipes.*

A. mœsto proxime affinis et similis, sed major præcipue magis elongatus; toto niger, palpis apice rufis; capite ovato oculis parum prominentibus; thorace sicut in *A. mœsto* sed longiori, subcirculari, postice perparum angustato, margine laterali postice et basali (utrinque) elevato; elytris elongato-oblongo-ovatis, apice distincte sinuatis, striatis, striis parum conspicue punctulatis, interstitiis subconvexis, tertio tripunctato; tarsis posterioribus opacis late sulcatis, supra medio angustissime unicarinatis. Long. 8—10½ mm., ♂, ♀.

Junsai Lake, Hakodate; rare.

The side grooves of the four posterior tarsi are remarkably broad, and opaque with minute sculpture, leaving a narrow and sharp dorsal carina alone polished. A similar form is found in Eastern Siberia, apparently undescribed, in which the thorax is shorter (a little longer only than in *A. mœstus*), and the tarsal carinæ less narrow.

Anchomenus (*Agonum*) *suavissimus.*

A. gracili (Gyll.) proxime affinis; duplo major; gracilis, niger politissimus, elytris subopalescentibus; capite ovato; thorace ovato, quam longitudine vix latiori, lateribus æqualiter arcuatis, angulis anticis sat valde productis, posticis omnino rotundatis, fovea utrinque basali lata, lævi, medio lineola impressa; elytris elongato-oblongo-ovatis, apice sat sinuatis, plica basali antrorsum obliquata, dorso subtiliter sed acute punctulato-striatis, interstitiis planissimis, tertii punctis 2 et 3 in medio interstitio sitis; tarsis tenuibus, 4 posticis nitidis utrinque late sulcatis. Long. 9 mm., ♂, ♀.

Ogura Lake, Honjo, Tokio. Among reeds in marshes.

* It occurs in marshes, under dead reeds.

Anchomenus (*Agonum*) *Oguræ*.

A. æneotinctæ quam maxime affinis et similis, sed differt elytrorum striis haud perspicue punctatis, antennis (scapo articulisque 2—3 basi flavis exceptis) nigro-fuscis, &c. Supra fusco-æneus, corpore subtus (pectore lateribus fuscescentibus exceptis) antennis basi, thoracis elytrorumque marginibus, et pedibus flavo-testaceis; thorace transverso; elytris valde subtransversim sinuatis, disco utrinque areis duabus depressis. Long. 7—7½ mm., ♂, ♀.

Ogura Lake.

Anchomenus (*Agonum*) *charillus*.

A. dolenti (Sahlb.) similis, sed differt thorace longiori, postice angustato, angulis subrotundatis, pedibusque lætius rufescentibus. Subgracilis, supra æneus, subtus nigro-æneus, trochanteribus femoribus tibiisque testaceo-rufis, tarsis, antennis basi, palpis basi et apice, piceis; thorace quadrato-cordato ante medium leviter rotundato postice sat angustato, angulis posticis obtusissimis, margine basali prope angulos antrorsum arcuatim obliquato; elytris relative latis, postice paullo ampliatis, subtiliter striatis, striis haud perspicue punctulatis, interstitiis fere planis tertio 4—5 punctato. Antennæ articulo tertio dimidio apicali sat dense pubescenti. Long. 6¼ mm.

Summit of Iwaki-san, under stones by a rivulet; and one specimen on Ontake.

Colpodes Bentonis.

Quoad formam *Platynis* typicis similis, metathoracis episternis brevibus elytrorumque marginibus explanatis acutis, sed tarsis anticis bilobatis, &c. Elongatus, depressus, castaneo-fuscus vel niger, elytris viridi-auratis politis, antennis, partibus oris, elytrorum et thoracis marginibus explanatis pedibusque (femoribus interdum castaneo-fuscis) fulvo-rufis; capite post oculos modice prominulos elongato, gradatim angustato, collo supra transversim depresso; thorace cordato, angulis posticis productis acutis, antice lato cum angulis anticis late rotundato, prope basin valde sinuato; margine laterali explanato-reflexo; elytris ovatis, humeris late rotundatis, apice profunde sinuatis, margine laterali explanato-reflexo, punctulato-striatis, interstitiis vix convexis tertio

tripunctato. Tarsis anticis articulo quarto bilobato, lobis angustis, sat longis; intermediis bilobato, lobo exteriori longiori; posticis emarginato. Long. 10—12 mm., ♂, ♀.

Nikko; Awomori, under forest-trees.

Colpodes mutator.

C. Bentonis affinissimus, differt solum; 1, colore nigro elytris vix æneo-tinctis vel iridescentibus; 2, thorace antice paullo minus late rotundato margineque explanato-reflexis angustiori et angustius rufescenti; 3, elytris prope apicem paullo minus profunde sinuatis; 4, tarsis anticis minus longe bilobatis. Long. 11—12 mm., ♂, ♀.

Fukushima.

The slight differences above pointed out between this and the preceding are constant in the tolerably numerous series of both which I have examined. The form of the thorax varies a little; but it is always less broadly dilated anteriorly, and the dilatation is more in front, so that the posterior narrowing is longer and more gradual, the posterior angles being in both species almost equally projecting and acute. The colour is uniformly pitchy-black, shining, with a very narrow dull tawny edging to the thorax and elytra. Tho epipleuræ and femora are always dark like the under side of the body; the elytra are slightly tinged with bronze-green or are iridescent.

Colpodes integratus.

C. Bentoni et *mutatori* proxime affinis sed differt elytris apice vix perspicue sinuatis. Elongatus sat depressus, castaneo-fuscus, elytris aurato- vel viridi-æneis, antennis, palpis, elytrorum margine pedibusque (femoribus obscurioribus) piceo-rufis; thorace fere ut in *C. bentonis* cordato, prope basin valde angustato, sed angulis posticis minus productis, fere rectis, margineque haud perspicue vel vage rufescenti; elytris regulariter ovatis, versus basin angustatis. Long. 12 mm.

Miyanoshita.

The tarsal grooves, which are deep and well marked, especially on the middle tarsi in *C. Bentonis*, and rather less so in *C. mutator*, are in the present species scarcely visible.

Colpodes astictus.

Gracilis, elytris ovatis convexis; niger nitidus, palpis antennis tarsisque piceo-fulvis; oculis parvis modice convexis, capite convexo, postice prolongato, collo supra transversim depresso; thorace angusto, subovato, postice multo magis quam antice et recte angustato, angulis fere rectis (apice acutis), margine laterali anguste reflexo, lateribus et basi ruguloso-punctatis; elytris ovalibus, mox a basi angusto rotundato-ampliatis, apice oblique sinuatis, profunde striatis striis punctulatis, interstitiis modice convexis impunctatis. Mandibulæ maxillæ et palpi maxillares valde elongata; metathoracis episterna brevia; tarsi postici sat profunde et perspicue bisulcati, articulo quarto omnibus modice emarginato. Long. 11—12 mm., ♂, ♀.

Oyayama; Yuyama, in Higo; Kashiwagi, in Yamato.

Polymorphous as *Colpodes* is known to be, I place this species in the genus with great reluctance, the 4th tarsal joint being scarcely more emarginate than in many Anchomeni; it would, however, be still more out of place in any section of *Anchomenus*. In the long and projecting mandibles and impunctate elytral interstices it agrees with the species of *Colpodes* formerly included in the genus *Pleurosoma*, Guérin, but has little general resemblance to them. It has also some affinity to *Cyrtolaus*, Bates.

Colpodes amphinomus.

Agonis majoribus haud dissimilis; piceo-niger, nitidus, antennis, palpis, thoracis margine laterali pedibusque castaneo-rufis; capite post oculos convexos gradatim angustato, collo subconstricto; thorace subovato, postice multo magis quam antice angustato, angulis posticis rotundatis, anticis haud productis, margine laterali sat late explanato-reflexo, intra marginem et in fovea magna basali plus minusve punctato; elytris ovatis, humeris rotundatis, apice sinuatis, ad suturam obtusis, punctulato-striatis, interstitiis modice convexis, tertio tripunctato, puncto tertio prope apicem. Metathoracis episterna subelongata et angustata. Tarsi posteriores extus tantum sulculati; articulo quarto minime emarginato, anteriorum sat emarginato, lobis inæqualibus. Long. 8½—10 mm., ♂, ♀.

Kashiwagi and Oyayama.

Colpodes limodromoïdes.

Anchomeno (*Limodromo*) similis; valde elongatus, parallelogrammicus, piceo-niger nitidus, antennis palpis, thoracis margine laterali pedibusque castaneo-rufis, corpore subtus plus minusve castaneo; capite mox pone oculos valde prominentes angustato; thorace lævi, quadrato, paullo ante medium modice dilatato, deinde postice leviter sinuatim angustato, angulis posticis obtusis sed distinctis, margine laterali sat late explanato-reflexo; elytris prope apicem oblique sinuatis, apud suturam productis breviter truncatis, angulo suturali breviter dentato, dorso punctulato-striatis, interstitiis subconvexis. Metathoracis episterna elongata et angustata. Pedes elongati robusti; tarsi posteriores utrinque sulcati, articulo 4to omnibus emarginato. Long. 15 mm.

All the large islands, and in Sado. Has the habits of *Anchomenus livens*, and is rare.

As *C. amphinomus* and numerous similar species look like *Agona*, with tarsi modified in the sense of *Colpodes*, so this species may be looked upon as a *Limodromus* or a *Batenus*, Motsch., with similar modification. If this be truly the case, *Colpodes* is an artificial genus, composed of species of different generic groups, all having the tarsi more or less adapted for climbing up stems of plants or on foliage.

Colpodes elainus.

Elongatus, subdepressus, piceo-niger nitidus, elytris olivaceo-æneis, antennis, palpis thoracis margine laterali tibiis et tarsis castaneo-rufis; capite mox pone oculos valde prominentes recte angustato, collo subconstricto, palporum articulo terminali fusiformi (apice attenuato); thorace subcordato, antice usque ultra medium sat late rotundato, postice sinuato-angustato, angulis posticis parum obtusis, anticis valde rotundatis, margine laterali explanato-reflexo anguste castaneo-rufo, dorso transversim strigoso, foveis latis basalibus punctatis; elytris valde elongatis fere parallelis, apice oblique subsinuatis apud suturam subproductis rotundatis, punctulato-striatis interstitiis planis, tertio tripunctato. Metathoracis episterna angusta sed modice elongata. Tarsi postici extus sulcati; articulo quarto anteriorum quatuor sat

profunde bilobato, posticorum profunde emarginato. Long. 13 mm.

Kashiwagi.

Colpodes chloreis.

Elongatus, postice leviter ampliatus ; capite et thorace relative parvis, niger politis, elytris obscurius subcyaneo-æneis vel æneis, antennis palpis tibiis et tarsis castaneo-rufis, femoribus corporeque subtus piceis ; palporum articulo terminali fusiformi ; capite post oculos modice prominentes recte angustato, collo constricto ; thorace subcordato, antice perparum rotundato, postice modice angustato leviter sinuato, angulis posticis obtusis, margine laterali anguste explanato-reflexo subrufescenti, foveis lævibus ; elytris apice haud perspicue sinuatis, striis subtilissime punctulatis, interstitiis fere planis tertio tripunctato. Metathoracis episterna elongata et angustata. Tarsi posteriores utrinque sulcati, articulo quarto anteriorum profunde, posteriorum modice, emarginato. Long. 10 mm.

Hakone ; Nikko.

Colpodes sylphis, Bates.

Bates, Trans. Ent. Soc. Lond., 1873, p. 277.

Previously recorded from Hiogo only. Mr. Lewis has since found it abundantly at Miyanoshita, Oyama, Chiuzenji. It is similar in general form to *C. chloreis*, but differs by its brighter metallic colouring, more broadly margined thorax, with projecting hind angles, &c.

Colpodes Hakonus, Harold.

Harold, Deutsche Ent. Zeitschr., 1878, p. 213.

Hakone (*Dönitz*) ; Miyanoshita (*Lewis*).

Many specimens taken by Mr. Lewis differ from Harold's description, and from examples taken at Miyanoshita, in the hind angles of the thorax being obtuse or rounded, without any trace of "die äusserste spitze jedoch ziemlich scharf." I can detect no other difference : they are from Nikko, Iwaki San, Chiuzenji, Yuyama, and also from Miyanoshita, where the type-form occurs.

Colpodes speculator, Harold.

Harold, *l. c.*, p. 214.

Hakone (*Dönitz*); Chiuzenji (*Lewis*).

Colpodes aurelius.

C. modestiori proxime affinis, differt solum thorace angustiori late cordato elytrisque aurato-æneis; testaceo-rufus, capite et thorace supra et infra nigro-castaneis, hujus lateribus rufis; capite sicut in *C. modestiore* relative parvo, post oculos parum elongato; thorace breviter cordato-quadrato postice sinuato-angustato, angulis obtusis sed distinctis, lateribus minus late explanatis, valde reflexis; elytris profunde striatis striis punctatis. Long. 7 mm.

Miyanoshita and Oyama.

A large series, quite constant in the slight characters which distinguish it from *C. modestior*. The colour of the elytra is more golden brassy than in *C. lampros*, and has less of green tinge.

C. modestior is found also abundantly at Miyanoshita, and thence in various localities to Hiogo.

Colpodes rubriolus.

C. ruficipiti (auct.) similis. Læte pallido-rufus, elytris (cum epipleuris) viridi cyaneis margine basali et scutello rufis, femoribus apice nigris; thorace quadrato, paullo ante medium modice dilatato, antice magis quam postice angustato, angulis posticis obtusis sed distinctis; elytris ovatis, apice oblique biflexuoso-truncatis, angulo suturali spinoso, dorso punctulato-striato, disco post medium depresso, interstitiis planis; tarsorum articulo 4to anguste bilobato, posticorum lobis brevioribus parum inæqualibus. Long. $7\frac{1}{2}$ mm.

Near Kami-ichi; one example beaten off a large Celtis. In Ceylon an allied species occurs commonly in garden-refuse.

The *C. ruficeps* was originally described in the "Annulosa javanica" by Macleay; the name was afterwards applied by Eschscholtz to a Manilla species, and later on by Chaudoir to a species found in Bengal, Southern

India, and Ceylon. I think it very probable that all three are perfectly distinct species. Macleay's description is so short and vague that it would apply to all, and neither Eschscholtz nor Chaudoir seems to have examined an example from Java. A good series of a species from Java, which I obtained from Dr. Mohnike's collection, show a form of apical truncature quite different from that described by the other authors, the margin near the suture being straight for a short space, and armed at each angle (on each elytron) with a short tooth or spine, making the apex briefly quadrispinose. This may be the true *C. ruficeps*. Eschscholtz's species seems to have a slight sinuation, causing the suture to be simply acute. Chaudoir's differs in having the epipleuræ of the elytra red.

Euplynes Batesi, Harold.

Harold, Deutsche Ent. Zeitschr., 1877, p. 341.

Mohezi.

Mr. Lewis obtained this interesting insect in the Yokohama district, at Bukenji and Miyanoshita, and also at Junsai, in flowers and on foliage. Harold is undoubtedly right in referring it to the genus *Euplynes*, Schmidt-Goebel, which Chaudoir so strangely misunderstood, treating *Euplynes viridipennis* as a species of *Colpodes* allied to *C. ruficeps*. It is distinguished from *Colpodes* by the 4th tarsal joint being strongly bilobed in all the feet.

Perigona acupalpoïdes.

Acupalpo meridiano haud dissimilis. Subdepressa, castaneo-nigra, abdomine, partibus oris, antennis, pedibus, macula quadrata humerali suturaque, rufis; capite post oculos prominentes haud tumido; thorace transverso, quadrato, antice parum rotundato, postice modice angustato, angulis posticis obtusis, limbo interdum castaneo-rufo; elytris striatis, interstitiis convexis. Long. 4 mm.

All the islands; under bark of various trees, beech, oak, and fir.

The red sutural border is limited to the 1st interstice, and does not reach the scutellum; the shoulder-spot extends from the 3rd stria to the margin, and is not longer than broad.

Apparently allied to the Bornean *P. nigricollis*, Motsch.

Perigona discipennis.

Depressa, testaceo-rufa, capite (epistomate partibusque oris exceptis) maculaque oblonga posteriori elytrorum, nigris, interstitiis 1 et 2 margineque laterali et apicali rufis ; thorace transverso, quadrato, antice modice rotundato, postice angustato, angulis posticis obtusis ; elytris striatis, interstitiis convexis. Long. $3\frac{1}{2}$ mm.

Nagasaki, Konose, and Yuyama, under bark of fir.

The black or blackish discoidal streak of the elytra commences at about one-third the distance from the base in a nearly straight frontal edge, and extends to the apex and sides, not, however, including the extreme apical or lateral margins ; inwards it reaches the 2nd stria from the suture. The general form is oblong, rather narrow, and straight-sided ; the thorax flat.

Perigona sinuata.

Angustior, oblonga, minus depressa. Testaceo-rufa, capite supra et elytris fusco-nigris, his marginibus et linea suturali prope basin et apicem angusta sed post-medium dilatata et interstitia 1—3 tegenti, rufis ; thorace minus transverso, quadrato, postice longius et plus minusve sinuatim angustato, angulis posticis fere rectis, dorso convexiusculo, basi depresso ; elytris substriatis, interstitiis prope suturam convexis. Long. 3—$3\frac{1}{2}$ mm.

Miyanoshita ; Oyama. Under bark.

Perigona tachyoides.

Magis ovata et convexa ; fusca, capite thoraceque nigris vel castaneis, elytris testaceo-flavis macula communi anteriori (a basi et lateribus distanti) fasciaque subapicali fuscis ; antennis partibus oris pedibusque testaceis ; thorace valde transverso, postice sat angustato, angulis posticis obtusis sed distinctis, dorso parum convexo ; elytris prope suturam substriatis et interstitiis convexis sed versus latera lævissimis. Long. $3\frac{1}{4}$ mm.

Nagasaki, Kobé, and Kashiwagi.

Similar in colour and markings to *P. Beccarii*, Putz., from Borneo.

Pogonus Japonicus, Putzeys.

Putzeys, Ann. Soc. Ent. Belg., 1875, xviii., p. 8.

S. Nipon ; one example.

Not met with by Mr. Lewis.

Putzeys records a *P. flavipes*, Motsch., from Japan immediately after the above ; the species is no doubt the well-known *Patrobus flavipes*, and not a *Pogonus*, as the author's mode of entering it on the list would lead one to infer.

Trechus discus, F.

Tokio ; Niigata ; Hakodate.

Three examples not distinguishable from European specimens. Two of them are rather larger, *viz.*, $2\frac{1}{2}$—$3\frac{1}{2}$ lin. The size given by Schaum in the Ins. Deutschl. is $2\frac{1}{3}$ lin.

Trechus oreas.

T. rubenti proxime affinis sed differt capite multo angustiori, mandibulis valde elongatis, oculis parvis, etc. Gracile ovatus sat convexus, castaneo-rufus glaber, palpis antennis pedibusque pallidioribus ; capite angusto, elongato, post oculos parvos gradatim angustato ; thorace quam in *T. rubenti* longiori, subcordato ante basin profunde sinuato, angulis posticis acutis exstantibus ; elytris elongato-ovatis, humeris nullo modo angulatis, striis omnibus sat profundis 3—4 et 6—7 apice abbreviatis, interstitiis convexis. Long. $5\frac{3}{4}$ mm.

Iwaki-san. Under stones by a streamlet near the summit.

At first sight appears closely allied to *T. rubens*, but in outline more nearly resembling *T. procerus* or *T. navaricus* ; head and eyes similar in shape to those of the latter, but mandibles still more elongated,

Trechus punctatostriatus, Putzeys.

Putzeys, Deutsche Ent. Zeitschr. 1877, p. 85.

Japan (*Hiller*).

Mr. Lewis does not appear to have met with this species, which differs from *T. ephippiatus* in the striæ being all entire.

Trechus vicarius.

T. suturali (Putz.) simillimus, differt oculis minus prominentibus tubereque oculari post oculum longiori et minus abrupte angustato. Breviter ovatus, elytris quam in *T. suturali* paullo brevius et latius rotundatis; castaneo-fuscus, antennis palpis pedibusque testaceo-rufis, elytris sutura et margine anguste rufis; thorace sicut in *T. suturali* transverso, late-cordato, angulis posticis fere rectis sed margine ante angulos nullo modo sinuatis; elytris, striis 4—5 distincte impressis et punctulatis cæteris obsoletis, interstitio tertio punctis magnis tribus (prima in stria quarta). Long. $3\frac{1}{4}$ mm.

Ontake.

Closely resembles *T. suturalis*, Putz., from the Pyrenees. In colour the two are the same, except that in *T. vicarius* the external margins, as well as the suture, are reddish. There are, however, minute but decided structural differences, the chief of which is the longer tumid orbit of the eye, together with the much less convex eye itself. The elytral striæ are also fainter, and some of them more abbreviated towards the apex.

Tachyta nana, Gyllenhal.

Gyllenhal, Ins. Suec., ii., p. 30; Schaum, Ins. Deutschl. I., i., p. 747.

In all the islands; commonest under beech-bark, but found sometimes under fir.

A generally-distributed insect throughout the north-temperate zone; in America it extends into the tropics as far as Guatemala.

Tachys scydmænoides, Nietner.

Nietner, Ann. Nat. Hist., xii., 1858, p. 427.

Examples taken by Mr. Lewis at Hakodate do not differ from Chinese specimens from Kiu-Kiang and Foochow, which agree with Mr. Nietner's description of the species from Ceylon.

Tachys reflexicollis.

Breviter ovatus elytris valde convexis; testaceo-rufus palpis et pedibus flavo-testaceis, antennis (articulis 1—3 flavis exceptis) infuscatis; elytris paullo ante apicem macula transversa indistincta fusca; sulcis frontalibus elongatis, postice usque oculi marginem posteriorem extensis; thorace relative angusto, quadrato-cordato, postice sinuato-angustato ibique margine explanato-reflexo, angulis elevatis acutis; elytris apice subacuminato-rotundatis, striis utrinque profundis et punctatis 3, quaram 2nda et 3ia apice valde abbreviatis, striis 4ta et 5ta perspicuis sed subobsoletis. Long. $2\frac{3}{4}$—3 mm.

Near Nagasaki; shaken from bamboo refuse.

The reflexed postero-lateral margins of the thorax and raised acute hind angles distinguish this species. The elytra are as convex as in *T. globulus*, but not so steeply declivous at the apex. In general form the species resembles *T. apicalis* from Natal.

Tachys euglyptus.

Ovatus, convexus, æneus, antennis et femoribus piceis, his basi tibiis tarsisque flavo-testaceis; fronte utrinque striis impressis duabus brevibus; thorace late quadrato, antice sat rotundato postice paullo angustato sinuatoque, angulis posticis acutis supra carinatis; elytris striis omnibus valde impressis et punctatis 2—7 antice paullo, postice longius, abbreviatis, macula parva rufa ante apicem. Long. $2\frac{3}{4}$ mm.

Tokio.

Cillenum Yokohamæ.

C. laterali simile sed magis depressum, antennisque manifeste longioribus articulis singulis cylindricis. Supra olivaceo-æneum, elytris alutaceis subopacis; pedibus testaceo-rufis; antennis nigris, articulis 3-basalibus rufis, palpis rufis, maxillaribus articulis 2 apicalibus nigro-fuscis; thorace sicut in *C. laterale* sed angulis posticis obtusis nullo modo exstantibus; elytris prope basin plaga utrinque indistincta fulva, interstitiis planis. Long. $4\frac{1}{2}$ mm.

Kawasaki, near Yokohama; one example.

Lymnæum quadriimpressum, Motschulsky.

Motschulsky, Schrenck's Reisen, ii., 2, p. 90, pl. vi., fig. 8.

Bay of Avatcha; Kamchatka; Kuriles (*Motsch.*); Hakodate, under stones on the beach (*Lewis*).

Although closely allied to *L. nigropiceum*, this species is very distinct in the outline of its thorax (of which the sides are more gradually narrowed in an incurved line behind), and in its more oval elytra, brassy colour, black antennæ (except the basal joint), &c.

Bembidium (*Notaphus*) *Batesi*, Putzeys.

Putzeys, Ann. Soc. Ent. Belg., 1875.

Bembidium niloticum, Dej., Bates, Trans. Ent. Soc. Lond., 1873, p. 301.

I have again compared a Japanese specimen with a large number from Egypt and Mesopotamia, and find the slight differences between them indicated by M. Putzeys are not constant. It appears unnecessary, therefore, to separate the Japanese form. *B. opulentum*, Nietn., from Ceylon, appears to be the same species. An allied form, widely distributed in Australia (*B. Jacksoniense*, Guér. ?), has a decidedly broader thorax, and other differences.

Bembidium (*Notaphus*) *varium*, Oliv.

Oliv.; Schaum, Ins. Deutschl., i., 1, p. 684.

Hakodate; six specimens.

Although much smaller than European examples—$1\frac{2}{3}$ lin., the length given by Schaum being 2—$2\frac{1}{4}$ lin.—there seems no valid ground for separating the Japanese form. According to von Heyden's 'Catalog. der Coleopt. von Sibirien,' *B. varium* occurs throughout Siberia to Baikal and Kamchatka.

Bembidium (*Leja*) *articulatum*, Panzer.

Shichinohé.

Two examples, much resembling British specimens.

Bembidium (*Leja*) *Sturmii*, Panzer.

Panzer; Schaum, Ins. Deutschl., i., 1, p. 729.

Hakodate; three specimens.

Bembidium (*Leja*) *xanthocera*.

B. Sturmii simillimum; sed differt antennis testaceo-flavis.

South Yezo.

Bembidium (*Lopha*) *pædiscum*.

B. 4-*maculato* proxime affine et simile; differt solum pedibus pallide testaceis femoribus apice leviter infuscatis, antennisque obscure piceis articulis basalibus vix rufioribus; viridi-æneum, elytris (ut in *B.* 4-*maculato*) utrinque flavo bimaculatis sed macula posteriori minore rotundata interdum obsoleta, striato punctatis striis exterioribus postice valde abbreviatis; thorace (ut in *B.* 4-*maculato*) angulis posticis exstantibus. Long. 3—$3\frac{1}{2}$ mm.

Hakodate and Sapporo; in dry pastures.

I have compared this species with examples of *B.* 4-*maculatum* from Europe, East Siberia, and North America, and find it differs constantly in its darker (and somewhat shorter) antennæ and paler legs, with slightly fuscous knees.

Bembidium tetraporum.

B. prasino, Dufts., affine; sat depressum, olivaceo-æneum elytris fusco-testaceis marginibus æneis utrinque foveis duabus latis prima apud medium; antennis articulo primo rufo pedibus testaceo-rufis; sulcis frontalibus latis profundis flexuosis; thorace transversim quadrato ante basin sinuato modice angustato angulis posticis rectis, fovea basi rugulosa bistriata juxta angulum plica modice elevata; elytrorum striis integris 1—2, 3—4 et 6—7 apice conjunctis ibique 5ta profundius insculpta et curvata. Long. $4\frac{3}{4}$ mm.

Awakisan; Junsai; Sapporo.

Bembidium aureofuscum.

B. prasino, Dufts., affine. Angustior, parallelomorphum, supra fusco-aureum, versus latera viridescens; scapo rufo macula supra viridi-ænea, pedibus piceo-rufis;

foveis frontalibus latis ; thorace quadrato-cordato sinuato-angustato, angulis posticis rectis subacutis, margine basali utrinque obliquo, fovea basali bistriata, plicaque angusta elongata prope angulum ; elytris sat profunde punctato-striatis, striis omnibus æqualiter impressis, interstitio 3io bifoveato. Long. $4\frac{1}{2}$ mm.

Nagasaki, Kumamoto, and Miyanoshita.

The elytral striæ are equally impressed throughout, a character which distinguishes the species from *B. Hiogoense*, *prasinum*, and others, to which it is otherwise allied. The two setiferous punctures of the elytra are surrounded by large impressed foveæ, almost as conspicuous as in *B. tetraporum*, but the anterior puncture is situated considerably before the middle, and not, as in *B. tetraporum*, in the middle, of the elytra.

Bembidium pliculatum.

B. aureofusco affine sed paullo minus parallelomorphum, thoracisque plica juxta angulos parva vix perspicua. Oblongo-ovatum subconvexum, æneo-nigrum, antennarum scapo interdum subtus rufescenti ; thorace subquadrato, post medium modice sinuato-angustato, angulis rectis, fovea basali utrinque profunda plicaque parva parum elevata ; elytris passim profunde punctato-striatis, interstitio 3io bipunctato, haud foveato. Long. 4—$4\frac{1}{4}$ mm.

Sapporo ; Iwakisan ; Sendai.

The striæ are all strongly impressed, as in *B. aureofuscum*, to which the species is nearest allied ; but they are more strongly and sharply punctured, and the two punctures of the 3rd interstice are not impressed in foveæ or particularly conspicuous. The colour is dark greenish brassy, antennæ, palpi, and legs being also very dark, except the scape, which in some specimens is slightly reddish underneath. The stria and fold near the hind angle of the thorax are very short and faint, but distinct under the lens.

Bembidium (Peryphus) lucillum.

B. tibiali, Dufts., affine, sed minor et magis oblongum, tibiis nigris, etc. Oblongum sat depressum, cyaneo-nigrum supra subopalescens, antennarum scapo obscure rufo ; thorace cordato-quadrato parum transverso, pos-

tice sinuato-angustato angulis acutis, fovea basali utrinque profunda plicaque sat elongata juxta angulum; elytris passim acute striatis, striis subpunctulatis, punctis utrinque majoribus duobus sat conspicuis. Long. 4 mm.

Hakone.

In the subopalescent surface gloss and dark blue colour similar to *B. lisonotum*, Bates, but differs from that species in having a thoracic fold or carina near the hind angle.

The species agrees in many respects with *B. atro-cæruleum*, Steph., but it is more parallel-sided, and differs in the elytral striæ being impressed throughout; the opalescent gloss is less visible in some examples than in others.

Bembidium (*Peryphus*) *amaurum*.

B. cæruleo, Dej., simile, sed thoracis angulis posticis exstantibus, acutis, elytris grossius punctato-striatis. Oblongo-ovatum, sat convexum, nigro-cæruleum, antennis pedibusque piceo-rufis, palpis pallide rufis; thorace rotundato-cordato postice sat profunde sinuato-angustato, angulis exstantibus, basi sparsim rugoso-punctato, fovea utrinque profundo plicaque acuta prope angulum; elytris punctato-striatis, stria 7ma paullo minus (sed usque ad apicem) impressa. Long. $5\frac{1}{2}$—6 mm.

Hakodate.

Bembidium Nikkoense.

B. Normanno, Dej., proxime affine; paullo major, latius ovatum, pedibus rufis, etc., nigrum viridi-æneo tinctum, antennis articulis 1—2 et 3 basi pedibusque testaceo-rufis, palpis rufis, articulo penultimo fusco; sulcis frontalibus simplicibus, parallelis; thorace fere sicut in *B. Normanno* anguste cordato, basi grosse punctato, fovea utrinque basali lato et profundo, angulis posticis rectis; elytris paullo latius ovatis, striis modice impressis, 4—7 apice abbreviatis (apice lævissimo) cæteris grosse punctatis, apice concoloribus. Long. 4 mm.

Nikko.

Answers in some respects to the description of *B. misellum*, Harold; but the form of the thorax is entirely different from that of *B. velox* and *pusillum*, with which the author compares his species.

Bembidium (*Peryphus*) *elongatum*, Dej.

Dej., Sp. Gen., v., p. 148.

Hakodate; in crevices in a moist cliff.

The thorax is broader than in specimens from South France, Madeira, and Mesopotamia, but not much broader than in one from Malaga which I have at hand for comparison, or than in examples from Imeritia. The Japanese form differs, however, in having a few punctures on the sides of the forehead, besides the central puncture. *B. thermarum*, Motsch., from East Siberia seems to be the same species.

Bembidium (*Peryphus*) *cnemidotum*.

B. cribro, Duval, affine et simillimum, sed differt pedibus fusco-testaceis tibiis albescentibus, palpisque articulo penultimo nigro. Fusco-cupreum politum, versus apicem interdum rufescens; antennis articulis 1—2 palpisque (articulo penultimo nigro excepto) rufis, pedibus testaceo-fuscis tibiis albo-testaceis; capite et thorace viridi-æneo tinctis, illo puncto mediano frontali, hoc sat convexo, late cordato, prope basin solum angustato-sinuato, angulis rectis, basi sicut in *B. elongato* grosse punctato et late foveato; elytris punctato-striatis, striis 2—7 ante apicem obsoletis. Long. 5—5½ mm.

Sapporo.

Bembidium (*Peryphus*) *oxyglymma*.

B. lissonoto, Bates, et *decoro*, Panzer, affinis sed differt elytrorum striis omnibus acute insculptis, 6—7 prope apicem abrupte terminatis nec conjunctis. Parvum, oblongum, depressum, nigro-æneum, antennarum scapo rufo, pedibus palpisque basi rufo-piceis, thorace subcordato-quadrato, postice modice angustato-sinuato, angulis posticis subacutis, basi fovea sat profunda procul ab angulo sita; elytris acute striatis (striis vix perspicue crenulatis), omnibus æqualiter insculptis, 1—5 apicem conjunctis 2 apicem attingenti, 3—4 prope apicem conjunctis, 6—7 paullulum ante apicem abrupte separatim terminatis; punctis duobus dorsalibus conspicuis. Long. 4½—5½ mm.

Kumamoto; Morioka.

Bembidium (*Peryphus*) *eurygonum.*

B. oxyglymmæ affine et simillimum, sed differt corpore ovato nec oblongo, thoraceque magis transverso, basi latiori et angulis posticis exstantibus acutis. Oblongo-ovatum, nigro-æneum, antennarum scapo rufo, pedibus fusco-piceis; thorace late quadrato, prope basin valde sinuato modice angustato, apud angulos posticos dilatato, angulis acutis, fovea basali simplici alutacea; elytris acute striatis (striis vix perspicue punctulatis) omnibus æqualiter insculptis, 1—5 per apicem conjunctis, 2 apicem attingenti, 3—4 prope apicem conjunctis, 6—7 paullulum ante apicem separatim terminatis. Long. $5\frac{1}{2}$ mm.

Nagasaki; Kumamoto.

The relations of this species to *B. oxyglymma* are peculiar. The two seem to be found together, and are identical in colours and sculpture; but they differ distinctly in form, *B. oxyglymma* having the oblong, parallelogrammical, outline of *B. decorum* and allies, and *B. eurygonum* a broader and more ovate form, approaching *B. paludosum*; with this the thorax is distinctly broader behind, being laterally produced at the angles, which are acute. It is probable, nevertheless, that the two are varieties of one and the same species. There are males and females of both forms.

In striation the two species resemble *B. planiusculum*, Mannerh., from N.W. America.

Bembidium (*Peryphus*) *sanatum.*

B. lunato, Dufts., proxime affine, sed differt thorace multo angustiori anguste subcordato, postice valde angustato ibique lateribus fere parallelis, angulis acutis, fovea basali profundissima, punctata carinulaque elongata juxta angulum. Elongatum subgracile, olivaceo-æneum politum, palpis, antennis (versus apicem leviter infuscatis) pedibusque testaceo-rufis; elytris immaculatis, punctato-striatis, striis, suturali marginalibusque exceptis, ante apicem obsoletis ibique apice lævissimis. Long. $5\frac{1}{2}$ mm.

Niohozan; near the snow in June.

Bembidium (*Peryphus*) *semiluitum.*

B. colluto, Bates, affinissimum, forsan ejus varietas geographica; minor, antennis articulis 5—11 et 4ti basi, nigro-fuscis; elytris apice late et vage testaceo-rufis. Elongato-ovatum, viridi-æneum, palpis, antennarum articulis 1—3 et 4ti basi, pedibusque testaceo-rufis; thorace late quadrato, postice parum angustato, basi utrinque bistriato plicaque juxta angulum; elytris striato-punctatis, striis 2—7 ante apicem obsoletis, versus apicem rufescentibus, interdum toto rufo-translucentibus. Long. 4½ mm.

Honjo; marshes.

Bembidium (*Peryphus*) *chloreum*, Bates.

Bates, Trans. Ent. Soc. Lond., 1873, p. 332.

Kumamoto and Ogura Lake. Previously recorded only from Kiu-Kiang, China.

Bembidium misellum, Harold.

Harold, Deutsche Ent. Zeitschr., 1877, p. 342.

Tokio (*Hilgendorf*).

A specimen from Wada togé, taken by Mr. Lewis, agrees fairly well with von Harold's description, except that the striæ, although strongly punctured, seem scarcely enough deeply impressed. Von Harold compares his insect to *B. velox* (*lampros*), to which the Wada togé specimen is very closely allied.

Bembidium leucolenum.

Oblongo-ovatum, cupreo-fuscum lateribus viridi-æneis, antennis palpis pedibusque nigro-fuscis, tibiis testaceis; sulcis frontalibus flexuosis subparallelis, inter sulcum et oculum puncto magno setifero; thorace late quadrato-cordato, prope basin sinuato-angustato, angulis posticis subacutis, fovea basali profunda plicaque acuta juxta angulum; elytris parum convexis, punctato-striatis, striis 3—7 prope apicem obsoletis, 8—9 sat separatis sed in sulcum latum correntibus ante apicem conjunctis; femoribus sat incrassatis. Long. 5½ mm.

Nikko; in the streets, running in the sun.

Very near *B. lampros*, but much larger and more robust. The basal rim of the elytra forms a sharp angle with the margin at the shoulder, as in *B. splendidum*.

Bembidium (*Hydrium*) *pogonoides*.

B. splendido, Sturm, affine. Oblongum, æneum nitidum, antennis (articulis basalibus rufis exceptis) femoribusque piceis, tibiis et tarsis testaceis, palpis rufis articulo penultimo piceo; thorace quam in *B. splendido* latiori, late quadrato, paullo ante medium rotundato-dilatato, deinde antice magis quam postice angustato, angulis posticis rectis, basi bistriato plicaque prope angulum; elytris humeris acutis et acute marginatis punctato-striatis, striis parum impressis 2—7 versus apicem vix perspicuis (5ta apice flexuosa et sat profunda excepta). Long. $5\frac{3}{4}$—6 mm.

Niigata; also Eastern Siberia.

Closely allied to *B. splendidum*, which, together with many other allied species, belongs to the same section (*Hydrium*, Lec. *olim*) as the North-American *B. lævigatum*, Say. It differs from *B. splendidum* by its larger size, and by the thorax being much less narrowed behind; in fact, more narrowed in front and distinctly wider at the base than on the front margin.

Bembidium æneipes.

B. striato, F., multo angustior, thorace subconico, a basi usque ad apicem fere recte angustato. Supra viridi-auratum vix nitidum, medio cuprascens; antennis palpis pedibusque viridi-æneis; capite angusto, sulcis frontalibus longis parallellis, interspatio angusto, convexo; thorace alutaceo, medio nitido, basi utrinque striola curvata impresso; elytris angustis, a basi oblique leviter ampliatis, deinde parallelis, apice conjunctim subacute rotundatis, punctato-striatis, striis 6—7 prope humeros obliteratis, 8—9 sat late separatis sed profundius impressis; interstitiis planis, tertio punctis parvis duobus. Long. $4\frac{1}{2}$—$5\frac{1}{2}$ mm.

Sapporo; Chiuzenji.

Of the species known to me most nearly allied to *B. inserticeps*, Chaud., but very distinct, and approaching *B. stenoderum*, Bates; the two marginal striæ are

more widely separated, and the elytra more obliquely widened from the shoulders, than in *B. inserticeps*. The thorax is of remarkable form, much the widest at the base, and, with the exception of a very slight widening in the middle, narrowed to the apex, the apical angles advanced and acute. Dull-coloured specimens are reddish coppery, subopaque, with elytral borders widely green, and extreme margins golden. In an immature example the legs and antennæ are pitchy red.

Bembidium chloropus.

B. æneipedi affinis, sed major; toto æneum nitidum, pedibus viridi-æneis, femoribus basi tibiisque medio testaceis; antennarum scapo subtus testaceo, palpis articulo penultimo viridi-æneo; sulcis frontalibus elongatis, interspatio convexo; thorace a basi usque ad apicem modice angustato, medio paullulum dilatato, angulis anticis productis, basi alutaceo, fovea utrinque modice impressa; elytris ab humeris oblique ampliatis, deinde parallelis, apice conjunctim acuminatis; punctato-striatis, stria 7ma apud humerum obsoleta, 8—9 sat late separatis sed profundius impressis, interstitiis planis, tertio punctis duabus parvis. Long. $5\frac{3}{4}$—6 mm.

Hakodate.

Bembidium (*Bracteon*) *striatum*, Fab.

Fab.; Schaum, Ins. Deutschl., i., 1, p. 677.

Niigata.

Trigonodactyla insignis. (Pl. XIII., fig. 6).

T. cephaloti, Dej., simillima, forsan ejus varietas geographica. Elongata, linearis, fulvo-testacea capite thorace antennisque rufo-castaneis, elytris macula ovata communi post medium nigra; capite magno fere quadrato, lævi, sulcis frontalibus postice intus curvatis; thorace cordato grosse irregulariter punctato; elytris punctato-striatis, interstitiis planis, tertio punctis setiferis parvis 3 vel 4. Long. $8\frac{1}{2}$ mm.

Yuyama; Hitoyoshi; under reeds on elevated downs.

Mr. Lewis has compared his specimens with others of *T. cephalotes* from India in the British Museum, and finds them specifically distinct. Among other distinguishing characters he remarked the impunctate

head and more deeply impressed frontal furrows; the latter curve inwardly behind, and terminate before reaching the crown; they are sharply and obliquely cut, and separated from the fine sculptured line near the eyes by a wheal, moderately elevated. The specimen figured is a variety, in which the elytral spot extends to the apex.

Casnonia litura (*Odacantha*, id.), Schmidt-Goebel.

Schmidt-Goebel, Col. Birm., p. 22.

"Virgin's Peak," Nagasaki; three specimens.

Casnonia ægrota.

C. (*Odacanthæ*) *fulvipenni* proxime affinis et simillima, sed differt statura graciliori præcipue capite post oculos rectius et longius angustato. Gracilis, nigro-fusca, capite et thorace ænescenti-nigris politis, antennis articulis 3 et 4to basi pedibusque flavo-testaceis, elytris fulvo-testaceis; capite impunctato (mandibulis palpisque piceo-rufis) thorace quam in *C. fulvipenni* paullo graciliori antice magis angustato, lævi, pronoti margine basi, prosternoque apice punctatis; elytris punctato-striatis, striis basi parum versus latera et apicem nullo modo, impressis. Long. 7 mm.

Niigata; Honjo.

Extremely near *C. fulvipennis*, which, if I have determined the species rightly, is found at Hong-Kong, and not in Celebes, as stated by Chaudoir. It differs, however, a little in form, the head in both sexes being more straightly narrowed, and appearing longer behind the eyes. The margins of the pronotum also have only a row of large punctures, few in number, instead of being thickly punctured, and the thorax seems to taper more gradually in front.

Chaudoir gives no reason for placing his species in *Odacantha* rather than in *Casnonia*. It is certainly much more nearly related to the group of *Casnonia* of which *C. fuscipennis* is the type, than to *Odacantha melanura*. There appears, however, to be no structural differences between the two genera, the shorter and more oblong form of the thorax and slightly thicker palpi in *Odacantha* being the only perceptible difference.

Drypta Japonica.

Drypta lineola, Dej., var. *Japonica*, Bates, Trans. Ent. Soc. Lond., 1873, p. 303.

Abundant at Tokio, Kioto, Osaka, Nara, Niigata, and other places, among reeds in marshes.

Mr. Lewis has convinced himself, on the comparison of a long series, that this form is very distinct from *D. lineola*, Dej. Baron Chaudoir (Bull. Mosc., 1877, i., 262), is correct in saying that the Chinese examples of *lineola* with which I compared *D. Japonica* are his *D. virgata*, but he committed an error regarding *D. Japonica* which is unintelligible; the differences stated in my description are accurate, and hold good over a large series of examples.

Drypta fulvcola.

D. distinctæ affinis sed differt corpore supra toto badio-fulvo, elytris vix perspicue fusco-marginatis; subtus capite, pro- et mesothorace, coxis et trochanteribus fulvis; metathorace abdomine et pedibus chalybeis; antennis fulvis scapo et articulo tertio dimidio apicali chalybeo. Long. 9 mm.

Honjo, in Tokio; at roots of reeds. Very local.

Differs from *D. distincta* in form as well as in colour; being decidedly narrower and more slender in all its parts; the interstices of the elytra also are more strongly punctured.

Dendrocellus geniculatus, Klug.

Klug, Jahrb., i., p. 52.

Yuyama; in bundles of a reedy grass on elevated slopes, cut for roofing purposes. Also Burma, Assam, Java.

Brachinus æneicostis.

B. stenodero, Bates, affinis sed angustior, elongatus subgracilis, elytris obscure viridi-æneis subopacis, costis utrinque 8 angustis æneis politis, tota superficie (costis inclusis) minute granulatis; capite mox pone oculos angustato, supra punctato; thorax minus elongato. antice paullo magis rotundato-dilatato, postice sat profunde sinuatim angustato, angulis posticis acutis, dorso

crebre ruguloso-punctato, abdomine (segmento 2ndo medio rufo excepto) fusco ; antennis pedibusque testaceo-rufis, articulis 3—7 leviter infuscatis ; antennis minus elongatis. Long. 12 mm.

Ogura Lake ; a marsh-loving species.

Catascopus ignicinctus.

C. virenti, Chaud., affinis, supra nigro-cyaneus, elytris igneo-cupreo marginatis, subtus nigro-piceus, antennis palpisque apice piceo-rufis ; fronte utrinque (prope oculum) pluristriata, medio epistomate et collo lævibus ; vertice punctato ; thorace postice valde sinuatim-angustato, angulis posticis acutis, dorso leviter striguloso ; elytris sat late quadratis, apice ad suturam obtusissimis, extus haud angulatis, dorso punctato-striatis, interstitiis planis, 5to angustato modice convexo, 7to carinato, 8—9 igneo-cupreis. Long. $10\frac{1}{2}$—12 mm.

Yuyama and Konose ; under bark.

Lioptera erotyloides. (Pl. XIII., fig. 5).

Late oblongo-ovata parum convexa, nigra, subopaca, elytris fere lævibus sericeo-nitentibus utrinque maculis vel fasciis multidentatis rufis duabus, altera basali altera paullo ante apicem ; capite coriaceo, versus oculos ruguloso ; thorace valde transverso lateribus angulisque anticis valde rotundatis, margine late explanato, angulis posticis subrectis, supra opaco coriaceo ; elytris subtilissime striato-punctulatis, interstitiis planissimis et subtilissime punctulatis, apice oblique sinuato-truncatis. Long. 11 mm.

Yuyama, in fungi on trees ; and one example at Junsai.

The red markings of the elytra are similar in form to those of *Episcapha* and allied genera of *Erotylidæ*. The basal spot has three denticulations on its posterior margin, and anteriorly emits a branch which extends to the base and shoulder ; the posterior spot or fascia extends across the elytron, but without reaching the suture or margin, and is dentate on both its edges. The species fits but imperfectly into Chaudoir's genus, and differs in many important points from the only other one known, *L. quadriguttata* from the Philippines. I have had for some years in my collection a

large species from Borneo very closely allied to *L. erotyloides*, differing chiefly in the total absence of striæ or rows of punctures.*

Coptodera Japonica. (Pl. XIII., fig. 4).

C. piligeræ, Chaud., simillima, sed differt thorace multo latiori et postice minus angustato. Late oblonga, castaneo-fusca, partibus oris, antennis pedibusque obscure rufis, femoribus tibiisque plus minusve infuscatis. elytris utrinque maculis angulosis duabus fulvis, altera prope basin interstitia 3—7 (interdum 4—6 vel 4—5 solum) tegentibus altera prope apicem apud interstitia 2—8, fasciam dentatam flexuosam formanti; thorace valde transverso, mox a collo late rotundato post medium modice et vix sinuatim angustato, angulis posticis rectis, margine explanato-elevato plus minusve rufescenti; elytris apice parum oblique et sinuatim truncatis, subpunctulatim striatis, interstitiis omnibus æqualiter convexis. Long. 9—10 mm.

Kiushiu, elevated forests, in fungi.

Allied to *C. subapicalis*, Putz., and *C. piligera*, Chaud., the latter of which appears to be undescribed. It has been communicated to me by M. René Oberthur as bearing that name in the Chaudoir collection, and as having been taken by Père David in China.

Coptodera subapicalis, Putzeys.

Putzeys, Deutsche Ent. Zeitschr., 1877, p. 84.

Hagi (*Hiller*). In all the islands, rather common in old trees in winter, and on foliage in summer.

Mochtherus luctuosus, Putzeys.

Putzeys, Ann. Soc. Ent. Belg., 1875 (vol. xviii.), p. 9.

Kiushiu and south of main island.

Lioptera Plato. Magna, late-ovata parum convexa, nigra fere opaca, elytris utrinque signatura angusta triramosa prope basin et humerum, altera transversa (antice ramum unicum postice ramos duo emittenti) rufis; capite et thorace coraceis et strigulosis, hoc valde transverso, lateribus late explanato-reflexis, postice parum angustato, angulis posticis vix rectis; elytris subtilissime punctulatis striis omnibus obsoletis. Long. 18 mm. North Borneo.

Dolichoctis ornatellus.

D. quadriplagiatæ, Mots., affinis sed multo minor thoraceque medio angulato, etc. Sat elongato-ovata, castaneo-fusca (subtus pallidior) capite thoraceque interdum castaneo-rufis, elytris utrinque maculis duabus rotundis fulvis; antennis, palpis, thoracis elytrorumque marginibus pedibusque testaceo-fulvis, femoribus tibiisque interdum infuscatis; capite subtilissime striguloso, subopaco; thorace sat elongato, paullo ante medium angulatim dilatato, deinde antice magis quam postice subrecte angustato, angulis posticis fere rectis, dorso striguloso sat nitido; elytris apice sinuato-truncatis, angulis haud dentatis, dorso striatis, interstitiis planis. Long. 5—5½ mm.

Yuyama and other places in Higo.

Very near *D.* (*Mochtherus*) *rotundata*, Schmidt-Goebel, but apparently distinct. There are several other closely-allied species in the Indo-Malayan region.

Dromius prolixus.

D. quadraticollis (Moraw.), Bates, Trans. Ent. Soc. Lond., 1873, p. 307.

D. agile, F., multo magis elongatus et relative angustior, supra castaneo-fuscus subtus castaneo-rufus, partibus oris, antennis et pedibus fulvo-testaceis; capite parvo, ovato, palpis gracilibus acuminatis; thorace anguste quadrato, antice vix rotundato, postice parum angustato, subsinuato, angulis posticis fere rectis; elytris angustis, elongatis, postice gradatim sed perparum dilatatis, apice recte sinuato-truncatis, sat profunde subpunctulatim striatis, interstitiis subconvexis, subtilissime alutaceis, nitidis, 7mo pluripunctato. Long. 6½—7½ mm.

Junsai; Kawachi; Nikko.

I had formerly referred this species to *D. quadraticollis*, Moraw., from the Amur, but it is clearly distinct, though very closely allied, the antennæ not answering to Morawitz's description "antennarum basi pedibusque ferrugineis," but being unicolorous tawny-red. The outline of the thorax varies a little; in specimens from Nikko it is distinctly narrowed from the slight anterior rounding to the base, and the posterior angles are very

slightly prominent; but in others from Kawachi it is as wide at the base as in front, and the angles are more prominent. All intermediate gradations occur, and the following may be only an extreme form.

Dromius campanulatus.

Paullo minus elongatus; thorace campanuliformi, basi dilatato; cæteris ut in *D. prolixo*. Long. $5\frac{1}{2}$—$6\frac{1}{2}$ mm.

Higo; Fukushima; Miyanoshita and Kiga.

The thorax is much the widest at the hind angles, being narrowed thence, first in a straight and then in a curved line to the anterior margin. As some gradations occur, I doubt whether it keeps itself as a distinct species from *D. prolixus*.

Dromius breviceps.

D. agile affinis, magis elongatus; a *D. prolixo* et *D. agile* differt capite ante oculos multo abbreviato, obtuso, labro mandibulisque brevibus, palpis crassis, articulo ultimo elongato-ovato prope apicem lateraliter excavato; elongato-oblongus, nigro-piceus, antennis palpis pedibusque fulvo-testaceis; femoribus flavescentibus; capite brevissimo, post oculos nec rotundato, recte angustato, fronte multi-rugulosa; thorace quadrato, antice fere ut in *D. agile* usque ad collum modice rotundato, sed postice minime angustato, angulis posticis elevatis apice rotundatis, dorso striguloso; elytris parallelis, apice fere recte truncatis, striis vix impressis interstitiis convexis. Long. 7 mm.

Yokohama, under Celtis bark.

Very distinct from *D. prolixus* and *campanulatus*. Colour above wholly pitchy black, with a silky gloss; legs yellowish testaceous; palpi thick, last joint ovoid; head much shortened anteriorly, rounded, and obtuse; elytral striæ very faint and not perceptibly punctulated, &c. It is much more nearly allied to a Central American species, *D. Guatemalenæ*, Bates; the row of punctures on the 7th interstice is scarcely visible.

Dromius crassipalpis.

D. brevicipiti proxime affinis, minus elongatus, quoad formam *D. agili* similis, supra nigro-piceus, thorace interdum rufescenti; antennis, partibus oris pedibusque

fulvo-testaceis; capite antice modice elongato, fronte lævi; thorace quadrato, postice sinuato-angustato, margine explanato-subreflexo, angulis posticis fere rectis; elytris apice leviter sinuatis, striis acutius quam in *D. agile* impressis, interstitiis convexis alutaceis, 3io et 7mo seriato-punctatis. Variat pedibus piceo-rufis. Long. 6—7 mm.

Oyama, in Sagami.

Resembles *D. agilis*, but the head is perfectly smooth above and not rounded behind the eyes, and the thorax is less narrowed behind, with sinuated margins and nearly rectangular hind angles. Palpi thickened as in *D. breviceps*.

Blechrus glabratus, Duftsch.

Duftsch., Schaum, Ins. Deutschl., i., 1, p. 275.

Junsai; Sapporo.

A universally-distributed insect in the north-temperate zone; in America ranging as far south as Mexico.

Blechrus maurus, Sturm.

Sturm, Schaum, *l. c.*, p. 276.

Bukenji; in dry arable fields early in spring.

Rather more distinctly striated than European examples usually are.

Metabletus quadripunctatus, Schmidt-Goebel.

Schmidt-Goebel, Col. Birm., p. 39. ?

Yuyama.

A single specimen agreeing with Schmidt-Goebel's description, except with regard to the punctures on the 3rd interstice, which, according to him, are two in number, one in the middle, the other far behind,—in fact as in *D. foveola* and *inæqualis*. The single Japanese example is evidently an aberration, as there are two punctures on the left elytron and four on the right. It would be unsafe to found a new species on a unique specimen in doubtful condition.

Demetrias marginicollis.

D. atricapillo longior, præcipue capite et thorace magis elongatis, illo post oculos prolongato perparum rotundato, hoc ante basin vix sinuato angulis posticis obtusis; flavo-testaceus, capite nigro epistomate partibusque oris rufis, thoracis marginibus lateralibus anguste nigro-fuscis, elytrorum sutura fusca; capite impunctato; elytris punctulato-striatis, striis versus latera minime impressis. Long. $5\frac{1}{2}$ mm.

Miyanoshita, Honjo, and Nowata.

In the elongate head and thorax agrees with *D. Amurensis*, Motsch. (= *sibiricus*, Mor.?) and *D. longicollis*, Chaud., from Eastern Siberia. But in the description of neither is any mention made of the fine brown margins of the thorax, which distinguishes the Japanese form; from *D. longicollis* besides, of which I possess a specimen, it differs in many points. The dusky streak along the suture covers one interstice near the base and widens to two interstices from the middle to near the apex.

Lachnoderma asperum. (Pl. XIII., fig. 2).

Oblongum dense erecte pubescens, nigrum nitidum, elytris, unguibus, abdominisque apice castaneo-rufis; capite grosse punctato medio sublævi; oculis valde prominentibus; thorace lato et brevi, basi lobato, antice explanato-dilatato, rotundato, medio angulato, deinde postice valde sinuato-angustato, angulis posticis productis acutis, limbo toto grosse scabroso-punctato, disco lævi; elytris striato-punctatis, punctis profundissimis, interstitiis sparsim punctulatis, apice transversim truncatis, angulis exterioribus valde rotundatis; tarsis supra pubescentibus, articulo 4to bilobato; unguibus basi dilatatis et longe pectinatis. Long. 8 mm.

Above Miyanoshita. One example under a stone; another, partly eaten, in an ant's nest; May 3rd, 1880.

I refer this curious species to the genus *Lachnoderma*, instituted by W. Macleay for an Australian species in Trans. Ent. Soc., N. S. W., vol. ii., p. 321. *Singilis hirsutus*, Bates, Trans. Ent. Soc. Lond., 1873, p. 333, from Hong-Kong, is another species of the same genus. Chaudoir referred *Lachnoderma* to his subgroup *Physodérides*.

Pentagonica angulosa.

P. subcordicolli, Bates, similis sed differt ab omnibus affinibus thorace utrinque biangulato; nigro-nitida, partibus oris pedibusque flavo-testaceis, antennis piceo-fuscis, articulis 2 basalibus pallidioribus, thorace elytrorumque marginibus angustis rufescentibus; thorace valde transverso, postice ab angulo laterali explanato-marginato, ante basin obtuse angulato, deinde usque ad basin sinuato; elytris punctulato-striatis, interstitiis sat convexis. Long. 5 mm.

Yuyama; Kashiwagi; Nikko; always in or about fungi.

The second angle on the sides of the thorax is distinct also in *P. hexagona*, Woll., and *P. suturalis*, Schaum, but in no species is it so well developed as in *P. angulosa*, the explanated margin forming a distinct projection.

Lebia fusca, Morawitz.

Bates, Trans. Ent. Soc. Lond., 1873, p. 318.

Miyanoshita and in Yezo.

Described by Morawitz from examples taken at Hakodate. The fourth tarsal joint, as stated by the describer, is bilobed.

Lebia duplex.

L. fusca simillima, sed differt tarsorum articulo 4to emarginato nec bilobato, thorace et elytris haud distincte rufo-marginatis. Long. $7\frac{1}{2}$ mm.

On all the islands; on foliage in May.

So near to *L. fusca* that there is scarcely any means of distinguishing it except by the important structural character of a simply emarginated fourth tarsal joint, the same joint having two fully-developed lobes in *L. fusca*. The form of every other part is as near as can be the same; but there appears to be a constant difference in the margins of the elytra and thorax being concolorous with the rest of the surface in *L. duplex* and reddish in *L. fusca*. The elytra have deep impunctate striæ, with convex interstices, in both species.

Lebia sylvarum.

L. japonicæ affinis; *L. idæ* ejus sectionis similis, thorace castaneo-rufo testaceo-marginato, sed differt elytris prope apicem flavo-fasciatis. Supra piceo-nigra nitida, thorace castaneo-rufo, testaceo-rufo marginato, elytris macula magna angulata anteriori discoidali fasciaque prope apicem (antice unidentata) margineque testaceo-flavis; partibus oris, antennis pedibusque testaceo-rufis; corpore subtus flavo-testaceo; oculis prominentibus, capite fere lævi; thorace transversim quadrato, postice vix angustato, margine explanato-reflexo recto, angulis posticis haud productis subrectis, dorso subtiliter ruguloso; elytris profunde striatis, interstitiis convexis; tarsorum articulo 4to bilobato. Long. $6\frac{1}{4}$ mm.

Higo; in moist forests at an elevation of 2000 feet.

Lebia Iolanthe.

L. japonica minor et angustior, oblonga, supra nigra, thorace rufo, antennis palpisque nigris illarum articulis 2 basalibus fusco-testaceis, elytris margine laterale et apicale maculisque ovalibus utrinque duabus (prima discoidali ante medium, secunda apicali juxta suturam) flavo-testaceis; corpore subtus pedibusque flavo-testaceis; capite subtilissime punctulato, prope oculos ruguloso, oculis prominentibus; thorace transversim quadrato, postice perparum angustato, margine explanato-reflexo, sinuato, angulis posticis acutis, dorso subtilissime coriaceo; elytris acute striatis, interstitiis subconvexis alutaceis; tarsorum articulo 4to bilobato. Long. 5—$5\frac{1}{2}$ mm.

Ontake; Subashiri; on Arctium.

ADDENDA.

The following species, overlooked by Mr. Lewis on the first arrangement of his new material, have to be added to the foregoing Supplement. They include one Palæarctic genus, *Penetretus*, new to the Japanese fauna, and increase the total number of described species to 408:—

Eucalathus atricolor.

E. æneolo angustior, piceo-niger, antennis partibus oris pedibusque piceo-rufis, femoribus paullo obscurioribus; thorace potius ovato quam quadrato, postice magis quam antice angustato, angulis posticis rotundatis; elytris profunde striatis, interstitiis convexis; tarsis posticis subtus parce hirsutis. Long. 11—13 mm.

Chiuzenji; Nikko; Nara; in damp shady forests.

The thinner clothing of hairs on the soles of the hinder tarsi prove that the dense clothing is not an essential generic character, this species belonging certainly to the same group as *E. æneolus*. In immature examples the legs and antennæ are tawny testaceous. Some examples are of very slender form, narrower in proportion than *Calathus Solieri*.

Pristodactyla crocata.

P. cathaicæ affinis; gracilior, nigro-picea, antennis partibus oris pedibusque fulvescenti-croceis; thorace sat elongato, lateribus modice rotundatis, ante angulos posticos perparum sinuato, angulis distinctis sed obtusissimis, margine anguste explanato plus minusve rufescenti; elytris oblongis, acute striatis, interstitiis ♂ subconvexis, ♀ planis margine interdum rufescenti; palporum articulo ultimo elongato, versus apicem leviter dilatato, apice truncato. Long. 12—14 mm., ♂, ♀.

Hakodate; Yokohama.

Two small males (9—11 mm.), taken at Sannohe, differ in their rather slenderer form, with sides of thorax much less rounded.

Colpodes eurydamas.

Late ovatus, modice convexus, supra nigra nitida elytris olivaceis subopalescentibus, antennis palpis tibiis et tarsis piceo-rufis; capite lævi, post oculos parvos modice prominentes oblique angustato, collo sat crasso nec constricto; thorace paullo ante medium subangulatim dilatato, antice recte angustato, angulis anticis productis, postice sinuatim angustato, angulis posticis rectis, marginibus explanato-reflexis; elytris latis apice late rotundatis, sinuatis, dorso striatis, interstitiis planis, tertio 3-punctato; tarsis omnibus articulo 4to emargi-

nato (angulo exteriori longiori); posticis utrinque sulcatis; mesothoracis episternis modice elongatis, latis. Long. 11½ mm., ♀.

Yuyama; two examples.

Unlike any other *Colpodes* known to me, and difficult to place in any of Chaudoir's sections. The length of the metathoracic episterna approaches that of the species of his third chief section, but they are much broader than in the numerous American species.

Colpodes Pryeri.

C. splendenti et *C. amæno* proxime affinis; aliter coloratus, subtus antennis pedibusque piceis, supra olivaceo-æneus politus, femoribus et palpis castaneo-rufis; tarsis omnibus supra bicarinatis, elytris apice suturali dentatis. Long, 12½ mm.

Oyama (*Mr. Pryer*).

The elytra are more brilliantly brassy olivaceous than the head and thorax, and the under side is pitchy black, instead of red as in *C. splendens* and *C. amœnus*; the sides of the thorax are less explanated and scarcely reddish.

Diplous depressus.

Patrobus depressus, Dejean, Sp. Gen. Col., v., p. 705; Chaudoir, Essai Monogr. s. l. groupe des *Pogonides*, p. 33.

Kashiwagi, river-bed on road to Shingu.

Mr. Lewis' specimens do not differ from others with which I have compared them from East Siberia.

Penetretus ambiguus.

Deltomero tatrico similis, paullo robustior; elongatus, subgracilis, nigro-piceus, glaber, subtus rufo-piceus, partibus oris, antennis pedibusque rufis; capite fere lævi, longe post oculos constricto; thorace fere sicut in *P. rufipenni* cordato, antice minus rotundato, basi parce punctato; elytris elongato-ovatis, versus basin gradatim angustatis, striatis, striis indistincte punctulatis; tarsis supra glabris. Long. 9—10 mm.

Summit of Ontake, July 29th, 1881.

Belongs to *Penetretus* by the glabrous upper surface of the tarsi, but in form and facies more resembling *Deltomerus*; the facies is something between *Patrobus excavatus* and *Deltomerus tatricus*.

Penetretus dilatatus.

P. ambiguo brevior et latior; piceo-niger, antennis partibus oris pedibusque picescenti-rufis; capite fere lævi; thorace late cordato, antice valde rotundato, postice sinuatim angustato, angulis posticis acutissimis, basi et lateribus punctatis; elytris latius ovatis, subpunctulato-striatis. Long. $8\frac{1}{2}$ mm.

Shimidzu-toge. One example (male) only.

Stomonaxus læviventris.

S. striatocolli similis sed angustior, elytris oblongis, subtus toto corpore lævissimo; piceo-niger, thoracis lateribus postice et angulis rectis; elytris lævi-sulcatis, apice juxta suturam vix rufescenti; antennis, partibus oris, pedibus, segmentisque 3 ultimis ventralibus, piceo-fulvis. Long. $5\frac{1}{2}$ mm.

Hakone; many examples in decaying beeches. Head and thorax sometimes rusty red.

Explanation of Plate XIII.

Fig. 1. *Cicindela ovipennis.*
2. *Lachnoderma asperum.*
3. *Carabus grandis.*
4. *Coptodera Japonica.*
5. *Lioptera erotyloides.*
6. *Trigonodactyla insignis.*
7. *Broscosoma elegans.*

XII. *Revision of the* Pselaphidæ *of Japan.*

By D. Sharp.

[Read July 4th, 1883.]

Until the year 1874 nothing whatever was known about the Japanese *Pselaphidæ*, but in that year I was enabled to describe, in the Society's 'Transactions,' twenty-four species of the family discovered by Mr. Lewis; and shortly afterwards Herr Julius Weise added, in the 'Deutsche Entomologische Zeitschrift,' three others found by Mr. Hiller at Hagi. Mr. Lewis has recently returned from a second visit to the Archipelago, bringing back with him a magnificent collection of Coleoptera, which we may hope will be well worked out, for it is sufficiently extensive to enable us to form an approximately just estimate of this department of the Japanese fauna, and to compare it with those of Europe and North America. What amount of endemic peculiarity in its fauna the Archipelago will ultimately prove to possess must, however, still remain undetermined, owing to the excessively imperfect state of our knowledge of the natural history of the neighbouring regions, the entomology of the North of China and of the Korea being among the least known of any part of the world. So far as the fauna of Eastern Siberia goes, there does not appear to be so great an identity between it and that of Japan, as from their geographical propinquity we might expect.

Mr. Lewis' recent discoveries enable me to bring the list of Japanese *Pselaphidæ* to sixty-seven species, assigned to seventeen genera, nine of these latter being, so far as we at present know, peculiar to Japan. Nearly one-half of the Japanese members of the family I have assigned to the genus *Batrisus*, which is one of the most extensive and widely distributed of the components of the family. The Japanese representatives of this genus are extremely varied, and, if studied without relation to those of other countries, might form several genera;

but when I examined the variations of structure existing in the *Batrisi* of Europe, North America, and other countries, I found it would not be desirable at present to divide the Japanese forms, most of the genera recently established at the expense of *Batrisus* being of doubtful validity. The Japanese *Batrisi* exhibit, however, but little affinity with the European members of the genus, and, if we eliminate them and the members of other widely-distributed genera from the list, we find that the relationship of the Japanese *Pselaphidæ* to those of Europe is limited to the possession of a species of the genus *Centrotoma* and four of *Bythinus*, all being, however, distinct species from any found in Europe. On the other hand, the contrasts between the two faunæ are very striking. *Bythinus* forms, in Europe, thirty per cent. of the Pselaphid fauna, whereas in Japan it is reduced to six per cent. One-half of the Japanese genera are not found in Europe, and nearly three-fourths of the European genera have no species in Japan; while the group *Euplectini*, forming one-sixth part of the European fauna, has as yet no representative in Japan. The two faunæ, then, have only a slight special relationship. Special affinity between the Japanese and North American faunæ of *Pselaphidæ* is still less, and is limited to the possession by Japan of three species of the genus *Tmesiphorus*. Although the Japanese fauna in this department appears thus at present to possess a considerable amount of peculiarity or endemicity (as I have heard it well termed by Mr. Bates), I am far from supposing that this will prove to be really the case, for so little do we know of the *Pselaphidæ* of the Oriental regions of the Eastern hemisphere that it is quite probable the whole of the peculiar Japanese genera may be ultimately found in these "terræ adhuc quoad Pselaphidas incognitæ," and that a considerable proportion of the actual species may be found in China and the Korea. Our views, too, may still be largely modified by the discovery of fresh forms in Japan itself, for I think it probable that there are at any rate 150 species of the family actually indigenous there, and compared with this number the 67 as yet brought to light appear comparatively unimportant.

The following is a list of the species arranged generically:—

PORODERUS.
Ctenistes armatus, Sharp.
,, *medius*, Sharp.
,, *similis*, Sharp.

CTENISTES.
Ctenistes mimeticus, n. s.
,, *oculatus*, Sharp.
,, *discedens*, n. s.
,, *breviceps*, n. s.

CENTROTOMA.
Centrotoma prodiga, Sharp.

STIPESA.
Stipesa rudis, Sharp.

RAPHITREUS.
Tmesiphorus speratus, Sharp.

TMESIPHORUS.
Tmesiphorus crassicornis, Sharp.
,, *princeps*, n. s.
,, *costatus*, Weise.

LABOMIMUS.
Labomimus reitteri, n. s.

LASINUS.
Lasinus spinosus, Sharp.

TYRUS.
Tyrus japonicus, n. s.

BATRISUS.
Batrisus euplectiformis, n. s.
,, *spinicollis*, n. s.
,, *longicornis*, n. s.
,, *angustus*, Sharp.
,, *punctipennis*, n. s.
,, *palpalis*, n. s.
,, *acuminatus*, n. s.
,, *vestitus*, n. s.
,, *caviceps*, n. s.
,, *oscillator*, n. s.
,, *politus* n. s.
,, *concolor*, n. s.
,, *fissifrons*, n. s.
,, *ornatus*, Sharp.
,, *basicornis*, n. s.
Batrisus rugicollis, n. s.
,, *ornatifrons*, n. s.
,, *stipes*, Sharp.
,, *solitarius*, n. s.
,, *gracilis*, n. s.
,, *dissimilis*, Sharp.
,, *puncticollis*, n. s.
,, *fragilis*, n. s.
,, *japonicus*, n. s.
,, *fallax*, n. s.
,, *similis*, n. s.
,, *pedator*, n. s.
,, *modestus*, Sharp.
,, *antennatus*, Weise.
,, *optatus*, Sharp.

MORANA.
Morana discedens, Sharp.

ACETALIUS.
Acetalius dubius, n. s.

BRYAXIS.
Bryaxis princeps, Sharp.
,, *alienus*, Sharp.
,, *cubitus*, Sharp.
,, *mundus*, Sharp.
,, *affinis*, n. s.
,, *pullus*, Sharp.
,, *curtus*, Sharp.
,, *crassipes*, Sharp.
,, *latifrons*, n. s.

TRIOMICRUS.
Triomicrus simplex, n. s.
,, *protervus*, Sharp.

BYTHINUS.
Bythinus affinis, n. s.
,, *japonicus*, Sharp.
,, *subseriatus*, Weise.
,, *reversus*, n. s.

PSELAPHUS.
Pselaphus debilis, n. s.
,, *lewisii*, n. s.

DIARTIGER.
Diartiger fossulatus, n. s.
,, *spiniger*, n. s.

Porodérus, n. g.

Closely allied to *Ctenistes*, but the 2nd joint of the maxillary palpus is destitute of articulated appendage. Differs from *Enoptostomus* by the great elongation transversely of the terminal joints of the palpi, by the elongation of the perpendicular front of the head, by the elongate hind trochanters, as well as by the form and stature, which are those of *Ctenistes*.

The genus will include, so far as at present known, only the Japanese species, *P. armatus*, *P. medius*, and *P. similis*.

Ctenistes armatus.

Ctenistes armatus, Sharp, Trans. Ent. Soc. Lond., 1874, p. 111.

Mr. Lewis has found, at Yokohama, a few specimens, male and female, of a *Porodérus*, the male of which agrees pretty well with the typical male specimen of *P. armatus*, except that the antennæ are slightly shorter, the 7th joint especially being less elongate, and the terminal joints of the maxillary palpi scarcely so elongate externally; they can scarcely be more than a variety. In the female joints 4—6 are not quite so short as they are in the male, and the 7th joint also is slightly longer; but the 8th joint is quite small, and the terminal three joints are each a little shorter than in the male, the 9th and 10th both being each only about as long as broad. These individuals indicate that the female indicated by me as being perhaps that of *C. armatus* (Trans. Ent. Soc. Lond., 1874, p. 111) is more probably that of a closely-allied distinct species; Mr. Lewis has indeed found at Hakone a second example of it, but at present it had better not be described, a knowledge of the male being indispensable.

Ctenistes medius.

Ctenistes medius, Sharp, *l. c.*

Neither this nor the following have been yet found again, so that both are still unique.

Ctenistes similis.

Ctenistes similis, Sharp, *op. cit.*, p. 112.

Ctenistes.

This genus and its allies offer, even at present, great practical difficulties in their limitation, each of them showing much variety in structure of the forms included in them. The Japanese species, even after the separation of those assigned to *Porodcrus*, are heterogeneous, *C. mimeticus* being apparently a typical *Ctenistes*, while *C. oculatus* is very isolated; and *C. discedens* approaches in some respects to the North American forms of the genus; *C. breviceps* again belonging apparently to the subgenus *Sognorus* of Reitter. The species seem to be of great rarity, with the exception perhaps of *C. breviceps*.

Ctenistes mimeticus, n. s.

♀. Rufus, nitidus, sat crebre setulosus; antennis minus elongatis, apicem versus incrassatis, articulo septimo quam contiguis paulo longiore, undecimo præcedentibus duobus simul sumtis paulo longiore. Long. $2\frac{1}{4}$ mm. N.B. feminæ *C. armati* fere omnino similis, notis generis fere tantum differt.

Ctenistes medius, ♀ ?, Sharp, Trans. Ent. Soc. Lond., 1874, p. 112.

This insect resembles excessively the female of *C. armatus*, but differs therefrom by the 2nd joint of the maxillary palpi being armed with a seta, and by the posterior trochanters being shorter and not clavate.

A specimen was found in the Nagasaki district, April 12th, 1881; and the insect I queried as being possibly the female of *C. medius* is also an individual of this species. The two specimens agree entirely in all characters of importance, and are, I presume from the structure of their antennæ, females.

Ctenistes oculatus, Sharp.

Sharp, Trans. Ent. Soc. Lond., 1874, p. 110.

This remarkable insect is still unique, and is very distinct from any other *Ctenistes* known to me; the tenuity of its tibiæ is very remarkable.

Ctenistes discedens, n. s.

♂. Testaceus, crebrius pallido-setulosus, antennis elongatis, articulis 9o et 10o præcedentibus parum longioribus, articulo terminali sat elongato ; capite brevi, oculis magnis ; prothorace brevi, setuloso sed haud sculpturato, elytris hoc duplo longioribus ; pedibus elongatis tenuibus. Long. 2 mm.

This is another very aberrant *Ctenistes* quite dissimilar from any other known to me, and cannot be associated with the species of either of the two subgenera proposed by Reitter, nor with any North American species known to me. The antennæ are nearly $1\frac{1}{4}$ mm., the 3rd joint rather longer than the 2nd, it and joints 4—8 scarcely differing from one another, each longer than broad ; 9th and 10th subequal, each longer (but not greatly so) than the 8th ; 11th joint about equal in length to them together. Head short and broad, with very large eyes. Thorax slightly transverse. Three first dorsal segments about equal to one another. Hind trochanters moderately long, stout, not clavate.

The individual described is no doubt a male ; it has the anterior trochanters and the base of the femora armed beneath with erect setæ, the metasternum deeply and broadly impressed along the middle, and the ventral segments somewhat depressed on the middle for the greater part of the length of the hind body.

Hitoyoshi, 8th May, 1881.

A specimen found at Kioto on the 10th June, 1881, is probably the female of this species ; it has the same setulosity on the front legs, and the trochanters correspond, except that those of the middle and hind legs are rather shorter ; the antennæ are different, being much shorter ; joints 3—10 slender, each longer than broad ; 10th about equal in length to the 3rd, but a little stouter ; terminal joint rather stouter, as long as the three preceding together ; metasternum less impressed ; ventral segments not impressed.

Ctenistes breviceps, n. s.

Flavo-castaneus, elytris rufescentibus, crebrius, subtiliter flavo-setulosus, palpis testaceis articulis ultimis extus parum prolongatis ; capite brevi, lato ; prothorace

transverso, basi vix discrete foveolato, elytris hoc vix duplo longioribus. Long. 1½ mm. Mas, antennis articulis 3—7 brevioribus, 8—11 elongatis inter se subæqualibus.

This species may be placed in the subgenus *Sognorus*, Reitter. Compared with *Ctenistes Oberthuri*, it is slightly larger, with the elytra longer and not so narrow in front; the antennæ of the female are formed much as in that sex of *C. Oberthuri*, joints 3—9 differing but little from another, while the 10th is rather larger, slightly transverse; terminal joint large and stout, as long as the three preceding together. In the male joints 4—7 are short and similar to one another; 8—10 elongate, subequal, each twice as long as broad; terminal joint rather longer than the preceding. Head quite broad and short, the two foveæ of the vertex large. Thorax evidently transverse. Elytra densely setulose at their hind margin. Posterior trochanters quite short. The sexual characters, except as regards the antennæ, are slight.

Tokio, 25th March, 1880; Yokohama; Niigata, 13th September, 1881; in all seven specimens, of which two only are males.

Centrotoma.

Centrotoma prodiga, Sharp.

Sharp, Trans. Ent. Soc. Lond., 1874, p. 107.

Mr. Lewis has found a second individual of this species, with the claviger ant, on the Shiwojiri-toge, 30th July, 1881. The species is truly a *Centrotoma*, distinguished from *C. lucifuga* by the more distant and coarser setulosity, and by the less transverse, more bead-like, joints of the antennæ.

Stipesa.

Stipesa rudis, Sharp.

Sharp, Trans. Ent. Soc. Lond., 1874, p. 109.

This anomalous insect is still unique, and on looking at it again, as I am enabled to do by the kindness of Mr. Lewis, I can find nothing in my description to alter or supplement. It appears to be, as conjectured by Herr Reitter, an anomalous member of the *Ctenistini*, having probably, though not certainly, unequal claws

to the tarsi; the squamosity of the surface is such as is considered diagnostic of the *Ctenistini* by Herr Reitter.

Raphitreus, n. g.

This genus is established for *Tmesiphorus speratus*, Sharp. When describing that insect I alluded to certain characters which distinguished it from its North American congeners, but did not think it necessary to give it a separate generic name; the progress of analysis since then renders this now inevitable. The important fact that each of the three terminal joints of the maxillary palpus is provided externally with a setiform appendage differentiates the insect from *Tmesiphorus*; in this respect it somewhat resembles *Desimia*, Reitter (*Tetracis*, Sharp), but this is the only point of considerable approximation between the two, and the structure of the head, thorax, and hind body are quite different. The other two Japanese *Tmesiphori* will pretty certainly constitute also a genus distinct from *Tmesiphorus*, as they have the mesosternum entirely ecarinate; but as this character has not been examined hitherto in the allies, they may at present remain in the genus. *Raphitreus* has the three terminal joints of the maxillary palpi rather stout and acuminate (but not prolonged) externally, and each armed with a conspicuous articulated seta; the head, thorax, and elytra are formed as in *Tmesiphorus*, and the basal dorsal plates of the hind body are carinate; the mesosternum also is strongly carinate along the middle. Whether *T. costatus*, Weise, be a *Raphitreus* or not, I cannot say; the species has not been found by Mr. Lewis, and is unknown to me.

Tmesiphorus speratus.

Tmesiphorus speratus, Sharp, Trans. Ent. Soc. Lond., 1874, p. 109.

Mr. Lewis has now found three other males of this species on Maiyasan, Kobè, 14th July, 1881; Kashiwagi, 23rd June, 1881; and at Oyama, 25th May, 1880. The female is still unknown.

TMESIPHORUS.

Tmesiphorus crassicornis, n. s.

Major, sat elongatus, fere nudus, parum nitidus rufus, antennis crassis, articulis 2—8 transversis, clava magna; prothorace densissime punctato, elytris abdomineque parce obsolete punctatis, illis ad humeros late profundeque impressis; mesosterno ecarinato. Long. 3 mm.

The peculiar sculpture and the excessively abbreviated clothing (the latter appearing indeed, without careful examination, to be entirely absent) render this fine species very readily identified; it has moreover the eyes less coarsely facetted than the other *Tmesiphori*; the sculpture of the thorax is excessively dense, so that the surface appears rugose and its punctuation less distinct than usual; the basal joint of the antennæ is elongate, about as long as the three following together.

In the male the antennæ are stouter than they are in the female, and the club is excessively thick; the 10th joint has its outer part sliced off, and this is also the case with the basal part of the following joint, and the 2nd and 3rd ventral segments are slightly depressed on the middle.

Mr. Lewis has found three specimens; one male with a black ant at Suwa Temple, Nagasaki, July 31st, 1871; a second male, also with a black ant, at Shiba, in Tokio, May 21st, 1880; and a female at Nanaye, S. Yezo.

Tmesiphorus princeps, n. s.

Major, elongatus, fusco-rufus, elytris rufis, crebrius breviter pubescens, parum nitidus, antennis elongatis, clava (feminæ) præsertim elongata, prothorace densissime sculpturato, opaco; elytris abdomineque obsolete punctatis, illis ad humeros depressis; mesosterno ecarinato. Long. $3\frac{1}{4}$ mm.

Judging from a single female, this is allied to *T. crassicornis*, but is abundantly distinct; the setiform appendages on the 2nd and 3rd joints of the palpi are remarkably elongate, and the subocular patches of pubescence are greatly developed; and the abdominal carinæ only reach the base of the 2nd segment instead

of extending for the greater part of its length, as they do in *T. crassicornis*.

Found in company with a black ant at Futai, Sept. 20th, 1881.

Tmesiphorus costatus, Weise.

Weise, Deutsche Ent. Zeit., 1877, p. 99.

Oshiroyama, near Hagi; found by Hiller.

I have not seen the species, which has not been met with by Mr. Lewis.

Labomimus, n. g.

The characters of this new genus are similar to those of *Lasinus*, with two important exceptions, *viz.*, that joints 2—4 of the maxillary palpi are angulate externally, and that the basal dorsal plate of the hind body is remarkably elongate, fully as long as the elytra. The basal joint of the antennæ is elongate, and the head is furnished with a very elongate prominence, the antennæ being inserted on the under surface of the anterior part of this prolongation. The trochanters are very elongate. The genus is thus a very distinct one to be located near *Lasinus* and *Tmesiphorus*.

Labomimus reitteri, n. s.

Elongatus, convexus, piceo-rufus, nitidulus, evidenter pubescens, prothorace obsolete trifoveolato; elytris stria suturali impressa, aliaque discoidali abbreviata, his striis ad basin foveolatis, abdomine segmento primo dorsali valde elongata, basi utrinque plicula elavata sat elongata. Long. $3\frac{1}{2}$ mm.

Antennæ stout, dark red, very elongate; basal joint about as long as the four following together, the three terminal joints forming a long slender club. Head coarsely and closely granulose-punctate, opaque; genæ angularly prominent beneath. Thorax narrow, longer than broad, very convex, the convex disc without sculpture, the rest granulose-punctate, an obscure fovea on each side (not near the base), and a more distinct one in the middle near the base. Elytra rather longer than the thorax, much narrowed at the shoulders, very sparingly

punctate. Hind body nearly black, sparingly pubescent. Legs elongate.

The unique example is, I presume, a male; the anterior trochanters have a short slender spine beneath, the femora a very long one; the middle trochanters have at the extremity a slender spine, and before this one or two acute asperities; the corresponding femora are angulate in the middle, and armed with a minute spine.

Hakonê, May, 1880.

I have much pleasure in naming this fine Pselaphid in honour of Herr Edmond Reitter, of Vienna, whose recently published 'Attempt at a Systematic Arrangement' of the family supplies a valuable clue for the determination of the numerous genera of the family.

Lasinus.

Lasinus spinosus, Sharp.

Sharp, Trans. Ent. Soc. Lond., 1874, p. 106.

Mr. Lewis found this species on several occasions about Nagasaki, in the months of March and April, 1881, and also at Kuroheiji, Miyanoshita, Kiga, Kioto, Kobè, Osaka, and Oyama, in Sagami; at Osaka it was found as late in the season as the 8th July.

It shows considerable variation in certain points, and, as the characters distinctive of the sexes are of a very peculiar and even contradictory character, it is desirable to briefly notice them. The male has a polished space on the inner face of the 10th joint of the antenna, near its apex; this space is variable in size, and where it is most developed the spot is also excavate, and the upper margin of the excavation is prolonged; occasionally this joint is simple: the anterior trochanter bears an acute spine, and the femur a still longer one; the middle trochanter is very strongly angulate beneath, and the femur has a very minute acute denticle. The armature of the female legs differs in that the spines are usually rather longer, and that the middle trochanter bears two spines, of which the outer one is rather elongate; thus the legs in this sex are more spinose than in the male. In each of the sexes the antennæ vary much in the elongation of their joints.

Tyrus.

Tyrus japonicus, n. s.

Rufus, abdomine fusco-rufo, evidenter pubescens, prothorace impunctato, basi linea curvata impressa parum distincta ; elytris humeris sat prominulis, intra humeros depressis, ad basin minute quadrifoveolatis, stria suturali, aliaque discoidali abbreviata ; abdomine segmento primo dorsali in medio ad basin plicula elevata parum conspicua. Long. 2 mm.

Mas, antennarum clava elongata, articulis 9 et 10 latitudine longioribus, femoribus anterioribus parum perspicue bituberculatis, trochanteribus intermediis longius bispinosis, abdomine longitudinaliter in medio depresso.

This species, allied to the European *Pselaphus mucronatus*, Panz., is nevertheless abundantly distinct therefrom by the rufescent colour, by the pubescent surface, less elongate thorax, and by the male characters ; it has, too, the maxillary palpi larger, though similarly formed, and their articulated apical seta remarkably conspicuous.

Nagasaki, March, 1881 ; Hitoyoshi, May 16th ; Kobè, June 6th ; Wada togè, Aug. 1st. In each case a single specimen only was found.

Batrisus.

The fine series of species of this genus, discovered by Mr. Lewis, shows that these forms constitute the most important portion of the Pselaphid fauna of Japan. They exhibit much variety in their structural characters, while the secondary sexual characters of the males show a multiplicity of various extraordinary and inexplicable structures of different kinds, and situate in diverse parts of the body, forming a series that is, I think, without equal in any other genus of Coleoptera. Although species of the genus *Batrisus* are in the European fauna but few, yet in many other parts of the world they form a large and important part of the *Pselaphidæ*, and a division or arrangement of the species is necessary, if only to facilitate their determination. Several genera and subgenera have been erected for the species, based chiefly on the European and North American forms, but they cannot be looked on at present as satisfactory, and a monographic revision of the whole of the genus will

be necessary before satisfactory results can be hoped for. The Japanese species do not fall satisfactorily into any of the genera or subgenera already established, and as it would be clearly, under the circumstances, unadvisable to create more new names, I have grouped the species in a preliminary manner so as to facilitate their study. Unfortunately the individuals of the species at my disposal are very few, the *Batrisi* in Japan, as elsewhere, apparently occurring to the collector only occasionally, and even then only in ones and twos.

I. 1*st dorsal segment of hind body but little longer than the* 2*nd*; 1*st*, 2*nd*, *and even* 3*rd segments with very slightly raised, but true, lateral margins*; *no spur at extremity of hind tibia*; *terminal joint of maxillary palpi short. B. euplectiformis only.*

Batrisus euplectiformis, n. s.

Minus convexus, evidenter pubescens, rufescens, elytris sanguineis; antennis crassiusculis articulis tribus ultimis conspicue latioribus; vertice profunde lateque curvatim impresso; prothorace ante basin in medio canaliculato, versus basin fortiter angustato, lateribus in medio angulatis; elytris subtiliter punctulatis, stria suturali subtili, pliculaque discoidali valde abbreviata, humeris minute angulatis; abdomine segmento duobus basalibus subæqualibus, segmentis 1—3 ad latera submarginatis. Long. 2 mm.

Mas, trochanteribus posterioribus subspinosis, segmentis ventralibus in medio depressis. Fem. incog.

This interesting species can be confounded with no other, by reason of the abdominal structure and the *Euplectus*- or *Trichonyx*-like form; it has no trace of a spur on the hind tibiæ.

A single individual only has been found on the bluff at Yokohama, May, 1880.

II. 1*st dorsal segment only about twice as long as the* 2*nd*; *side-piece of* 1*st segment very narrow, so as to form nearly or quite a lateral margin*; *such may also be distinguished, though very obscure, on the* 2*nd segment. Hind tibia without apical spur* (*or with only the rudiment thereof*). *Maxillary palpi rather elongate. B. spinicollis, B. longicornis, and B. angustus.*

The species of this group prove clearly that De Saulcy is correct in considering that the side-piece marked off by the curved plica of the 1st dorsal plate is really the homologue of the lateral margin; in *B. spinicollis* and *B. longicornis* this line is very close to the outside, and thus marks off a lateral margin, which is slightly raised; in *B. angustus* the line is further from the side, and makes the transition to the more ordinary species of the genus, in which a side-margin appears to be entirely wanting.

Batrisus spinicollis, n. s.

Rufescens, elytris sanguineis, longius pubescens, minus subtiliter punctatus; antennis elongatis, articulo singulo latitudine longiore; prothorace ad basin fortiter angustato, inæquali, disco profunde canaliculato, angulis elevatis quatuor armatis, lateribus impressis, medio lateris angulo prominulo; elytris minus elongatis, minus subtiliter punctatis, humeris parum angustatis, angulo prominulo minuto, striola discoidali brevi, obscura, basi quadrifoveolato; abdomine minus subtiliter punctulato, segmento secundo dorsali minus brevi, segmento basali parum elongato, secundo haud duplo longiore, plicula laterali a margine parum remota. Long. $2\frac{5}{6}$ mm.

The unique individual of this very distinct species is apparently a female; the forehead is depressed in the middle, the clypeus simple, the vertex carinate in the middle, but not at the sides, and the legs are quite unarmed.

Hitoyoshi, 7th May, 1881.

Batrisus longicornis, n. s.

Angustus, convexus, rufus, longius pubescens, antennis pedibusque elongatis, gracilibus; prothorace ad basin fortiter angustato, inæquali, opaco, disco profunde canaliculato, utrinque carinula elongata posterius angulatim elevata, ad latera impresso; elytris parce haud fortiter punctatis, stria suturali subtili, discoidali fere nulla; abdomine minus subtiliter punctulato, segmento secundo dorsali minus brevi, segmento basali parum elongato, secundo vix duplo longiore, plicula laterali ad marginem approximata. Long. 2 mm.

Mas, metasterno basi in medio angulariter biprominulo, trochanteribus posterioribus spinosis, abdomine segmento ultimo ventrali impresso.

Another very distinct species, allied, however, in many respects to *B. spinicollis*; the hind tibiæ are armed with a very short spur.

Two males of this species were found at Miyanoshita; and a female at Ichiuchi, on the Kumagawa, 1st May, 1881.

Batrisus angustus, Sharp.

Sharp, Trans. Ent. Soc. Lond., 1874, p. 113.

A second specimen of this species was found at Kiga; and another, with the front of the head rather differently formed, at Nagasaki, on the 18th April, 1881. I am by no means sure whether this latter individual is the male of *B. angustus* or another species altogether.

III. 1*st dorsal segment twice or three times as long as* 2*nd, its side-piece quite broad, though very distinct. Hind tibiæ with long apical spur; maxillary palpi with more or less elongate terminal joint. B. punctipennis, B. palpalis, B. acuminatus, and B. vestitus.*

The four species here associated are very distinct, *B. palpalis* having a peculiarly slender elongate terminal joint to the maxillary palpi, *B. acuminatus* an unusually conical hind body, and *B. vestitus* a largely-developed basal joint to the antenna, an enlarged cavity for its insertion (in the male at any rate), and a tibial spur less elongate than in the other species; it approaches in most respects to the species of Group VI., and its affinities will require more consideration.

Batrisus punctipennis, n. s.

Gracilis, rufus, parce sed evidenter pubescens, antennis fere gracilibus; palpis articulo ultimo elongato, gracili, capite lateribus pone oculos conspicue setigeris, vertice utrinque longitudinaliter carinato; prothorace elongato, elytris hoc longioribus, intra humeros impressis, fortiter punctatis; abdomine segmento primo dorsali sequentibus duobus paulo longiore, ad latera utrinque linea curvata a margine remota; tibiis posterioribus apice calcari elongato. Long. 2 mm.

This species, of which I have seen but two individuals of doubtful sex, much resembles *B. angustus*, but the hind tibiæ are armed with an elongate apical spur, and the curved line on the 1st dorsal plate is widely distant from the outside; the front of the head, too, in *B. punctipennis* is simple, but this may be only due to a difference of sex. The elongation of the terminal joint of the maxillary palpi approximates the species to *B. palpalis*, next which, notwithstanding the great difference in size, I have placed it.

The two individuals found have a very slight mucronation of the apex of the middle tibiæ.

Miyanoshita and Hakone.

Batrisus palpalis, n. s.

Major, densius pubescens, rufus, abdomine piceo, antennis sat crassis, elongatis, palpis articulo ultimo elongato, gracili; capite minus brevi, posterius angustato, oculis in medio laterum sitis, post oculos longius setigero; prothorace elongato, medio canaliculato, utrinque versus basin angulo elevato, ad latera longitudinaliter impresso; elytris striola (fere plicula) discoidali abbreviata, evidenter punctatis; abdomine segmento basali parum elongato. Long. $3\frac{1}{2}$ mm.

Mas, antennarum articulo ultimo elongato, oblique acuminato, intus ad basin processu prominulo; femoribus intermediis ad basin margine posteriore spina tenui armato. Fem. incog.

This fine and distinct species, by the shape of its head, reminds one of *Amaurops*, from which, however, it is very different by its robust make, and the comparatively short 1st dorsal segment. The large vertex of the head is shining, and separated by an elongate angular mark from the elevated antennal portion; this latter is in front much elevated and punctate, and bears behind an elongate carina; the forehead grades off to the clypeus without any interruption; the curved plica on each side of the basal dorsal plate is very far removed from the side; this plate is only a little longer than the 2nd and 3rd together, the 4th is more elongate than the 3rd, distinctly but not greatly shorter than the 1st; the apical spur of the hind tibiæ is very elongate.

A single specimen was found at Mayebashi, Aug. 28th, 1881.

Batrisus acuminatus, n. s.

Rufus, evidenter sed minus dense pubescens, antennis sat crassis, haud elongatis, palpis articulo ultimo sat elongato; capite minus brevi, posterius angustato, oculis in medio laterum sitis, post oculos longius setigero; prothorace sat elongato, medio canaliculato, utrinque breviter carinulata, carinula posterius angulatim elevata, ad latera longitudinaliter impressa; elytris fortiter punctatis, striola (fere plicula) discoidali abbreviata; abdomine conico, acuminato, segmento basali parum elongato, sequentibus duobus vix æquali. Long. $2\frac{1}{2}$ mm. Mas, incog.

The unique female appears to indicate a species closely allied to *B. palpalis*, and as of that species only the male, and of *B. acuminatus* only the female, is known, it is probable that the differences are in part sexual; *B. acuminatus* is, however, much smaller, has a scantier pubescence, more strongly punctured elytra, and a peculiarly conical hind body. The apical spur of the hind tibiæ is very elongate, as in *B. palpalis*, and the curved plica of the basal dorsal plate is very widely removed from the side. The antennæ are not so long as head and thorax; joints 4 and 5 are each about as long as broad, 6—8 very slightly shorter, 9th and 10th rather broader, the latter evidently transverse; terminal joint stout, obliquely acuminate, not so long as the three preceding together.

Nagasaki, 28th February, 1881.

Batrisus vestitus, n. s.

Major, robustus, rufescens, densius pubescens, palpis articulo ultimo sat elongato; prothorace medio tenuiter canaliculato, lateribus longitudinaliter impressis; elytris humeris haud denticulatis, striola discoidali abbreviata, basi tantum quadrifoveolato; abdomine segmento basali sequentibus duobus æquali; tibiis posticis calcari apicali minus elongato. Long. 3 mm.

Mas, antennis articulo basali crasso, facie anteriore subproducto, capite supra antennas crasse elevato, inter eas anterius depresso, clypeo verticali, carina elongata, transversa, sinuata munito, in medio altiore; tibiis anterioribus intus in medio denticulatis, abdomine seg-

mento ultimo ventrali fovea magna et profunda depressa. Fem. incog.

The antennæ are stout; joints 2—8 but little different from one another, being each about as long as broad; 9th joint very slightly, 10th a little more distinctly, broader; terminal joint scarcely broader, as long as the two preceding together, acuminate.

This species appears in the male sex to be very distinct; two specimens have been found. Hakone, amongst rotten wood; Chiuzenji, 24th Aug., 1881.

IV. 1*st dorsal segment about twice as long as the* 2*nd; side-piece broad or moderately broad. Hind tibiæ without apical spur. Front of head in male remarkable. B. caviceps and B. oscillator.*

In *B. oscillator* the line marking off the side-piece of the 1st dorsal segment does not extend to the hind margin.

Batrisus caviceps, n. s.

Major, gracilis, densius pubescens, rufus, antennis sat crassis, elongatis, palpis articulo ultimo sat elongato; capite minus brevi, posterius angustato, sed truncato, angulis posterioribus minute prominulis, dense pubescentibus, antennis a labro fissura profunda divisis; prothorace elongato, medio canaliculato, utrinque versus basin angulo elevato minuto, ad latera impresso; elytris crebrius evidenter punctatis, absque striola discoidali; abdomine elongato, segmento dorsali primo parum elongato, sequentibus duobus vix æquali. Long. 3 mm.

This is another very peculiar species, of which only a single specimen has been found; it is very remarkable by the structure of the head, which is thickened in the vertical direction, and so formed that the upper portion, on which the antennæ are inserted, is separated by a deep fissure from the labrum; the fissure can only be seen by looking at the head from the front; the antennæ have the basal joint rather long and stout, joints 2—9 each longer than broad, 10th about as long as broad, terminal joint stouter, acuminate, as long as the two preceding. The sides of the head are densely pubescent, and the under surface likewise. The lateral plica of the

abdominal basal segment is at the base only moderately distant from the side.

The sex of the unique individual is uncertain.

Yuyama, May 12th, 1881.

Batrisus oscillator, n. s.

Robustus, densius pubescens, subtiliter punctatus, subopacus, rufescens; prothorace medio tenuiter canaliculato, lateribus longitudinaliter impressis; elytris crebrius subtiliter punctulatis, humeris haud denticulatis, intra humeros depressis sed vix plicatis, basi fere absque foveolis; abdomine segmento basali sequentibus duobus æquali; tibiis posticis calcari apicali perbrevi. Long. $2\frac{1}{4}$ mm.

Mas, antennis articulo basali inflato, faciei anterioris angulo externo producto, capite supra antennas valde prominulo, inter eas profunde depresso, sub antennas longius penicillato; clypeo verticali, carina elongata, transversa, in medio processu libero parvo armata; abdomine segmento ultimo ventrali late impresso. Fem. incog.

This species is remarkable from the finer and close punctuation of the surface; the head is without any coarse punctuation, even on the greatly elevated antennal protuberances; it is allied by the structure of the head and antennæ to *B. vestitus*, from which it is readily distinguished by the very stout apical spur of the hind tibiæ.

Two specimens found with a *Formica* under a stone on the Mikuni togé, 22nd Sept., 1881.

V. *Surface of body glabrous. B. politus and B. concolor.*

The above character distinguishes the two species from all the others at a glance; they have also a peculiar formation of the head, the vertex being truncate behind, and separated from the neck by an abrupt, very short constriction or incision; there is no spur to the hind tibiæ. In other respects the two species are not closely allied.

Batrisus politus, n. s.

Rufo-sanguineus, lævigatus, nitidus, antennis crassioribus ; prothorace impressione hastata discoidali ; abdomine elongato, basi foveolis magnis, profundis. Long. $2\frac{3}{4}$ mm.

Mas, pedibus intermediis femoribus in medio breviter spinosis, tibiis intus ad apicem late emarginatis.

This species, which is in many structural features allied to the European *B. formicarius*, is readily distinguished by the polished shining and impunctate surface ; the hind tibiæ are without apical spurs ; the 2nd and following joints of the antennæ are remarkably thick, each being much broader than long, the 9th and 10th still rather broader, the terminal joint very thick, pointed on one side. Head without any distinct impressions ; the antennæ very widely separated. Thorax with a broad discoidal depression, which terminates behind by meeting an angulate transverse impression. Hind body with the 1st ventral segment with a very deep transverse impression behind the suture, and a rather longer and still deeper one on each side of it ; this segment is about equal in length to the two following together ; 4th segment nearly twice as long as the 3rd.

Three specimens were found with an ant at Chiuzenji, Aug. 22nd, 1881 ; and single specimens were also found at Hakone, Miyanoshita (in May, 1880), and Nishimura, 15th June, 1881, in old wood or dead trees.

Batrisus concolor, n. s.

Rufus, lævigatus, sat nitidus, antennis crassiusculis, articulis 2—6 subquadratis ; prothorace fere mutico, tantum obsolete canaliculato, ante basin foveolato ; elytris absque stria discoidali, et ad humeros vix depressis ; abdomine basi haud foveolato. Long. $2\frac{1}{2}$ mm.

Allied, in respect of the form of the head and the very widely separated antennæ, to *B. politus*, but very distinct by the abdominal structure. Joints 9 and 10 of the antennæ are broader than the preceding, strongly transverse ; terminal joint also very stout, acuminate. Head almost without impressions. Elytra remarkably even, with a sutural stria, which is minutely deepened at the base, but can scarcely be said to be foveolate, without

trace of any other stria or basal foveæ. Hind body with 1st segment scarcely equal in length to the two following together; the 4th but little longer than the 3rd; segments 2—4 obscurely punctulate; the basal one smooth, like the anterior parts. Hind tibiæ without apical spur.

A single specimen was found at Yokohama with a black ant, April 2nd, 1880. It is probably a female.

VI. *1st dorsal segment twice or nearly three times as long as the 2nd; its side-piece only moderately broad, or quite narrow; hind tibiæ with elongate apical spur. Male characters on front of head very remarkable, and frequently with great development of the basal joint of the antennæ. B. fissifrons, B. ornatus, B. basicornis, B. rugicollis, B. ornatifrons, and B. stipes.*

I have already stated that *B. vestitus*, placed in Group III., approaches the species of this group in many respects.

Batrisus fissifrons, n. s.

Nigricans, elytris sanguineis, antennis pedibusque rufis, longius pubescens; antennis sat validis ad apicem longius pubescentibus; prothorace impunctato, medio canaliculato, utrinque breviter carinulato ad latus impresso; elytris fere impunctatis; tibiis posticis calcari apicali elongato. Long. $2\frac{1}{2}$ mm.

Mas, antennis articulo basali elongato, crasso, angulo interno parum producto, clypeo anterius in medio processu triangulari latiore, tuberculis supra antennas, latis, planis, productis, rude granulosis, capite inter eas profunde depresso et anterius processu minuto parum conspicuo minuto; trochanteribus intermediis apice libero, curvato; metasterno late impresso; abdomine segmento basali ventrali in medio plicato-elevato, plicula ad apicem pubescente, segmento apicali medio lævigato, versus apicem bituberculato.

A single male of this species was found in Higo in 1882 by a native collector; it is closely allied to *B. ornatus*, but is rather larger and broader and blacker in colour; the basal joint of the antennæ of the male is rather broader, but its produced angle is less prominent, the flat antennal tubercles are broader and more coarsely

sculptured, and the elevation on the front of the head is much broader; the elevation on the basal ventral segment is conspicuous, and the tubercles on the apical segment, instead of being near the base, are near the extremity.

Batrisus ornatus, Sharp.

Sharp, Trans. Ent. Soc. Lond., 1874, p. 114.

A few additional specimens of this species were found about Nagasaki in March and April, 1881, and single specimens, which are probably females of the species, occurred also at Nikko and Yanoshiku in the autumn of the year, as well as one at Bukenji, near Yokohama.

Batrisus basicornis, n. s.

Angustulus, rufescens, evidenter pubescens, antennis sat validis; vertice impunctato, subtiliter carinato, tuberculis antennalibus latis, dense punctatis, fronte medio depressiusculo; prothorace medio canaliculato, utrinque breviter carinulata, carinula posterius tenuiter spinosa, ad latera impressa, fere impunctata; elytris plicula discoidali abbreviata, basi minute sex-foveolatis; abdomine segmento dorsali basali sequentibus duobus æquali; tibiis posticis calcari apicali longo. Long. $2\frac{1}{4}$ mm.

Mas, antennarum articulo basali valde dilato-laminato, facie anteriore producto, densius glanduloso-granulato, tuberculis antennalibus latis prominulis; clypeo processu transverso superne in elevationem tenuem prolongato; trochanteribus intermediis angulato-prominulis; segmento ventrali apicali in medio tuberculis elongatis, prominulis.

The male of this species is readily distinguished by the great development of the basal joint of the antennæ and the different form of the ornament on the clypeus; the female is apparently only to be distinguished from the corresponding sex of *B. ornatus* by the considerably greater breadth of the process of the head that separates the insertion of the antennæ.

Three specimens were found at Miyanoshita in April and May, 1880.

Batrisus rugicollis, n. s.

Angustulus, longius parum dense pubescens, rufescens, elytris magis sanguineis; capite thoraceque ubique densissime fortiter punctatis, opacis; elytris parcissime punctulatis, plicula discoidali abbreviata; abdomine segmento basali sequentibus duobus æquali. Long. $2\frac{1}{8}$ mm.

Mas, fronte inter antennas producto, anterius depresso et acuminato, clypeo utrinque sub antennas prominulo, in medio processu erecto ad apicem paulo latiore; trochanteribus intermediis spinosis.

This species is readily recognised by the extremely dense and coarse sculpture of the head and thorax. Antennæ similar in the two sexes; 1st joint very stout, simple; 2nd stout, bead-like, about as long as broad; 3—9 very little different from one another, each about as long as broad; 10th slightly broader; 11th a little broader, obliquely acuminate, rather longer than the two preceding together. Head nearly flat, except for an indistinct angular mark, terminated on each side behind by a very obscure fovea. Thorax rather short, a good deal dilated at the sides, the central channel indistinct on account of the sculpture. Basal segment with the side-piece marked off by a curved plica, rather narrow.

Four specimens; Oyama, in Sagami, and Miyanoshita, May, 1880.

Batrisus ornatifrons, n. s.

Longius, parum dense pubescens; capite profunde angulariter impresso, anterius fortiter punctato, vertice medio subtiliter carinulato; thorace minus fortiter asperato-punctato, medio canaliculato, utrinque subtiliter carinulato, lateribus longitudinaliter impressis; elytris parcissime punctulatis, plicula discoidali abbreviata; abdomine segmento basali sequentibus duobus æquali. Long. 2 mm.

Mas, fronte inter antennas producto, anterius depresso et acuminato, clypeo utrinque sub antennas prominulo, in medio processu erecto ad apicem minute furcato; trochanteribus intermediis spinosis.

This species appears to be very closely allied to *B. rugicollis*, but has greatly diminished sculpture of the

thorax and head, and some slight differences in the peculiarities of the structure of the head in the male. Only one individual has been found ; it is entirely yellow, probably from being rather immature.

Chiuzenji, Aug. 21st, 1881.

Batrisus stipes, Sharp.

Sharp, Trans. Ent. Soc. Lond., 1874, p. 115.

This has not been found again, and knowledge of the species is limited to two female examples, whose locality has not been recorded.

VII. 1*st dorsal segment rather elongate, as long as the three following together; side-piece rather narrow. Hind tibiæ with elongate apical spur. B. solitarius and B. gracilis.*

These two species, known only by unique examples, differ from the others by their more slender build and greater elongation of the basal dorsal segment. They differ from *Amaurops*, Reitter, by the possession of well-marked eyes, and by their less elongate hind body.

Batrisus solitarius, n. s.

Subgracilis, castaneus, nitidus, tenuiter sed evidenter pubescens ; antennis subgracilibus, articulo ultimo elongato, acuminato ; prothorace ante basin foveolato, medio absque canalicula, lateribus longitudinaliter impressis ; abdomine segmento primo dorsali sat elongato, medio utrinque plicula elevata, brevi. Long. $2\frac{1}{2}$ mm.

A distinct species, making some approach in appearance to the species of *Amaurops*. Antennæ with the basal joint moderately long, stout; 2nd more slender, but stouter than the following, longer than broad ; 3—8 rather slender ; 9th scarcely broader, but longer than the 8th, rather longer than broad; 10th not stout, subquadrate ; terminal joint much larger, elongate, and acuminate. Head narrowed behind the rather small eyes, which are situated in the middle of the sides ; all the vertex broadly impunctate and shining ; the antennal tubercles elevate and rugose ; the vertex carinate in the middle and conspicuously foveolate on each side ; the outside also carinate, the outstanding setæ of the genæ

very conspicuous. Elytra narrow in front, curved at the sides, convex, the discoidal plicula excessively short; shoulders without trace of prominent angle. 1st dorsal segment rather elongate, its curved lateral plica moderately distant from the side; 2nd segment fully one-third the length of the 1st. Hind tibiæ with rather long apical spur.

Only a single individual has been found; though the head is simple in front, it is possibly a male, as the intermediate femora are armed at a little distance from the base with a rather long spine.

Kiga, May, 1880.

Batrisus gracilis, n. s.

Gracilis, rufo-castaneus, nitidus, parcius sed longius pubescens; antennis subgracilibus, articulo ultimo elongato, acuminato, basali crasso et longo, sequentibus longitudine æquali; prothorace ante basin foveolato, dorso canaliculato, lateribus longitudinaliter impressis; abdomine segmento dorsali sat elongato, medio utrinque plicula elevata brevi. Long. $2\frac{1}{2}$ mm.

Of this insect only a single specimen is present; it is no doubt a male, and is closely allied to *B. solitarius*, but is rather more slender, and with the pubescence rather longer and more scanty. The basal joint of the antennæ is much longer, and the apical joint is armed at the base internally with a slender projection; the thorax is evidently channelled on the disc; the pliculæ on the basal dorsal segment are less distant, and the surface between them is more depressed, the apical spur of the hind tibiæ is more elongate, and the middle femora are armed near their middle with a very long spine.

Miyanoshita, May, 1880.

VIII. *Eyes large, placed at the back of the head, not in the middle of the sides, as in all the other groups; 1st dorsal segment very elongate, about six times as long as the very short second ring. No spur on hind tibiæ. B. dissimilis, B. puncticollis, B. fragilis, B. japonicus, B. fallax, B. similis, B. pedator, B. modestus, B. antennatus, B. optatus.*

The species of this group apparently form a well-marked genus, which may probably, however, be connected with *Batrisus* by species unknown to me, so that I do not give it a name. The only species I know belonging to it in addition to the Japanese forms are two from Siam. The male characters in *B. optatus*, and even in *B. modestus*, are of a most remarkable character; and in *B. pedator* we find, on the hind femora of the male, a peculiarity of structure which, as regards its function, is probably the same as the peculiar structure of the antennæ of *B. antennatus* and the front tibiæ of *B. modestus*. Like the other *Batrisi*, the species are probably submyrmecophilous in their habits; two of them were found in company with *Diartiger*.

Batrisus dissimilis, Sharp.

Sharp, Trans. Ent. Soc. Lond., 1874, p. 116.

Two other individuals have been found of this species, and as, like the former specimens, they possess no peculiar sexual marks, I am inclined to think they are all females, and that the male is still unknown.

Miyanoshita, May, 1880; Kobè, 12th July, 1881.

Batrisus puncticollis, n. s.

Brunneo-castaneus, evidenter pubescens; gracilis, antennis sat elongatis; capite thoraceque fortiter punctatis, hoc parte basali angusto haud brevi, dorso canaliculato, lateribus utrinque longitudinaliter impressis; elytris parum punctatis, stria discoidali elongata; abdominis segmento primo dorsali in medio utrinque plicula arguta sat elongata. Long. 2 mm.

Second joint of antennæ about as long as the 3rd and 4th together. Head very densely punctate, without transverse impression; vertex obscurely bifoveolate. Thorax coarsely punctured, but not so densely as the head. Elytra quite indistinctly punctate. The 1st dorsal segment very elongate, and with the two fine raised lines or plicæ more distinct and elongate than usual.

Although the male of this species has not been found, yet the female is so certainly distinct that I have no hesitation in naming it. On account of the coarsely-punctured thorax, it can only be confounded with *B. modestus* and *B. dissimilis*; it is larger than the former,

has the antennæ longer, and with longer 2nd joint, the basal portion of the thorax more elongate, and the raised lines on the 1st dorsal segment more elongate. It is smaller and more slender than *B. dissimilis*, and has the 2nd joint of the antennæ longer and stouter than the 3rd, instead of the two being subequal, as is the case in *B. dissimilis*, and the head is quite without the two large transverse depressions that are so conspicuous in the latter species.

Three specimens were found at Kashiwagi on the 18th June, 1881.

Batrisus fragilis, n. s.

Rufescens, nitidus, evidenter pubescens, antennis pedibus palpisque testaceis; capite anterius fortiter punctato, vertice bifoveolato; prothorace impunctato, dorso canaliculato, lateribus longitudinaliter impressis; elytris ad basin quadrifoveolatis, stria discoidali elongata. Long. 2 mm.

Mas, tibiis intermediis apice interno mucronato, abdomino segmento secundo dorsali in medio paulo quam ad latera longiore, tertio ad basin linea transversa depressa; segmento ultimo ventrali sat elongato, in medio utrinque obscure carinulato, carinulis setulosis, inter eas depresso.

Antennæ slender; basal joint short; 2nd longer than the 3rd; 7th rather longer than those adjacent to it; club slender, rather strongly pubescent; the 9th joint longer than broad; 10th also slender in the female, rather broader in the male; terminal joint acuminate. Head with a slight transverse channel marking off the clypeus, which is coarsely punctate, the vertex very little punctate. Thorax rather elongate, slender. Elytra quite without angle at the shoulder; the discoidal stria deep and elongate, but not quite reaching the extremity.

Of this species Mr. Lewis found fourteen specimens, seven of each sex.

Yokohama, 7th April, 1880; Kioto, 2nd July, 1881; Niigata, 6th and 13th Sept.

Batrisus japonicus, n. s.

Rufescens, nitidus, evidenter pubescens, antennis pedibus palpisque testaceis; capite anterius fortiter punctato, vertice bifoveolato; prothorace impunctato, dorso canaliculato, lateribus longitudinaliter impressis; elytris ad basin quadrifoveolatis, stria discoidali elongata. Long. 2 mm.

Mas, tibiis intermediis apice interno mucronato, abdomine segmento secundo dorsali margine posteriore lamina magna depressa, e setulis adpressis composita.

This species almost exactly resembles *B. fragilis*, except in the characters of the male, but these are so different as to leave no doubt of specific distinction between the two; the dense scale-like patch of the 2nd dorsal plate is very conspicuous in *B. japonicus*, and probably covers a transverse depression on the following segment, but this cannot be seen: the terminal ventral segment is not elongate, and is nearly simple.

Six males (but no female) were found of this species; an individual from Hakone (not found with the male from there) may possibly be the female of *B. japonicus*, although it presents scarcely any difference from the corresponding sex of *B. fragilis*.

Hakone and Miyanoshita; also Nagasaki.

Batrisus fallax, n. s.

Rufescens, nitidus, evidenter pubescens, antennis pedibus palpisque testaceis; capite anterius fortiter punctato, vertice bifoveolato; prothorace impunctato, dorso canaliculato, lateribus longitudinaliter impressis; elytris ad basin quadrifoveolatis, stria discoidali elongata. Long. 2 mm.

Mas, tibiis intermediis apice interno mucronato, abdomine segmento tertio dorsali fovea transversa magna et profunda, cujus margine posteriore curvato, in medio vix elevato, segmento secundo margine posteriore in medio utrinque setulis depressis sat elongatis; segmento ultimo ventrali haud elongato, in medio utrinque carinulato, carinulis obscure setulosis, inter eas depresso.

This species again is similar in all respects, except the male characters, to *B. fragilis* and *B. japonicus*; the specimens are eight in number, and all are males,

except that at Fukushima a female as well as a male was found; this individual exhibits, however, no difference from the corresponding sex of *B. fragilis*.

Junsai, on old trees; Miyanoshita, May, 1880; Fukushima, 28th July, 1881.

Batrisus similis, n. s.

Rufescens, nitidus, evidenter pubescens, antennis pedibus palpisque testaceis; capite anterius fortiter punctato, vertice bifoveolato, in medio subtiliter longius carinato; prothorace impunctato, dorso canaliculato, lateribus longitudinaliter impressis; elytris ad basin quadrifoveolatis, stria discoidali elongata. Long. $2\frac{1}{4}$ mm.

Mas, abdomine segmento secundo dorsali in medio brevissimo, fere nullo, segmento tertio fovea elongata, transversa, profunda, margine posteriore in medio lamina elevata, brevi; segmento ultimo ventrali simplice; trochanteribus posterioribus setulosis.

The hind margin of the basal dorsal segment in the male of this species is furnished only with short, inconspicuous pallid setæ; when an individual is examined exactly from behind, so as to look between the rings, it is seen that a large cavity exists between the 1st and 2nd rings (as well as another between the 2nd and 3rd), the 2nd ring being thrust as it were into the interior of the body beneath the 1st ring.

This is another species extremely closely allied to *B. fragilis*; I have seen only two examples, and from these I infer that, in addition to the male characters, it is distinguished from its allies by slightly larger size, by the more conspicuous depression on the front of the head, and by the evidently carinate vertex. Two males have been found.

Yokohama; Oyama, 25th May, 1880.

Batrisus pedator, n. s.

Rufo-castaneus, evidenter pubescens, antennis palpis pedibusque testaceis; capite subobsolete punctato, vertice bifoveolato; prothorace parum elongato, globoso-cordato, fere impunctato, dorso canaliculato, lateribus longitudinaliter impressis; elytris convexiusculis, obsolete punctatis, stria discoidali elongata. Long. $1\frac{7}{8}$ mm.

Mas, femoribus posterioribus facie anteriori late profundeque excisa, superne vesicula membranacea parvula erecta; metasterno in medio impresso, utrinque prominulo; abdominis segmentis ventralibus brevissimis.

Antennæ slender, rather elongate, the 3-jointed club elongate and slender. Head almost even, the vertex between the foveæ slightly convex. Elytra with an indistinct minute prominent angle on the shoulder, and with a broad discoidal stria which does not quite reach the extremity.

Although extremely similar to *B. fragilis* and its allies, this species is readily distinguished by the rather smaller size of its individuals, and their more globose prothorax. The male characters are extremely peculiar, the structure of the hind femora being, in fact, unique; they present, on their upper anterior face in the middle, an elongate deep cavity; in front of the cavity the surface forms a small angular prominence, on the summit of which is placed a minute delicate vesicle.

Mr. Lewis found a small series of this species at Niigata, 15th Sept., 1881; there are but three males to nearly a dozen females.

Batrisus modestus, Sharp.

Sharp, Trans. Ent. Soc. Lond., 1874, p. 116.

This species was described by me on two specimens, supposed, on account of a slight difference in the antennæ, to be male and female. Mr. Lewis has again met with the species, and discovered the male, proving the two original examples to be both females.

The following is a sketch of the remarkable male characters:—

Mas, tibiis anterioribus extus versus apicem dilatatis, in prominentia pencilla articulata armatis; pygidio excavatione magna, profunda, irregulari, ad latera excavationis glanduloso; segmentis ventralibus omnium brevissimis.

Of the species there are two varieties; in the first the front tibiæ of the male are not so much dilated, and have only a fine pencil; and the antennæ of the female are a little stouter than in the second form; in this latter the male tibiæ are considerably more dilated, and are armed with a broad pencil.

The species was met with by Mr. Lewis at Miyanoshita in May, 1880, and at Nagasaki in March and April, 1881.

It is possible the two supposed varieties may prove to be distinct species, in which case the one with broad male tibiæ should bear the name of *modestus*, a new name being applied to the form having more slender tibiæ in the male. All the Miyanoshita specimens belong apparently to the first form, but unfortunately most of the specimens met with are females. The peculiarity of the male tibiæ is not found in any other species, and is very curious; the pencil with which they are armed is apparently very mobile, and when depressed and applied to the front of the leg appears to be absent.

Batrisus antennatus, Weise (nec Motsch.).

Weise, Deutsche Ent. Zeit., 1877, p. 97.

A few specimens of this species have been found by Mr. Lewis at Nagasaki and Fukuhori in April, and at Sanjo and Niigata in Sept., 1881.

Batrisus optatus, Sharp.

Sharp, Trans. Ent. Soc. Lond., 1874, p. 112.

This remarkable species is still unique.

MORANA.

This is, I think, an ally of *Batrisus*; the maxillary palpi are formed as in that genus, and the peculiarities of the head are as much like *Batrisus* as *Euplectus*; the 1st basal ventral segment is visible and prominent between the hind coxæ; the claws are very small and their condition quite doubtful,—I do not think there are two equal ones, as I formerly considered, though with some doubt, to be the case; the elongate 2nd joint and the large terminal joint of the antennæ will greatly aid the recognition of the genus.

Morana discedens, Sharp.

Sharp, Trans. Ent. Soc. Lond., 1883, p. 118.

A second individual of this species was found at Nagasaki on the 19th April, 1881.

ACETALIUS, n. g.

Maxillary palpi quite short; terminal joint short and stout, oval in form; penultimate joint very small. Antennæ 11-jointed, short, with very large acuminate terminal joint, widely separated at their insertion. Head elongate in front of the eyes, which are placed near the hind angles, and are prominent, though rather small; antennal tubercles widely separated. Thorax elongate and narrow. Elytra subinflated. Hind body with very elongate basal segment, the others extremely short, the basal scarcely, or at least only excessively finely, margined at the sides; beneath composed apparently only of two segments, a very elongate one, and a short apical one projecting from it. Legs elongate; hind tibiæ without spurs; tarsi with a single elongate claw.

The minute insect for which this genus is established is of very doubtful affinities; the structure of its hind body is perhaps most like that of the *Pselaphini*, but the true 1st ventral segment is quite short, while those beyond the very elongate 2nd segment have disappeared; above the 1st segment is very elongate, while the following are very short and almost perpendicular. These peculiarities may perhaps be exaggerated, owing to the fact that the unique individual is immature, and the segments may therefore be collapsed to a certain extent. The head is quite different from the *Pselaphini*, and more like an elongate *Euplectus* head. The last joint of the maxillary palpus is terminated at its point by a short, straight, stout appendage. I can see no trace of a claw, but as the specimen of this minute insect is immature, and the feet have been covered with gum tragacanth, in accordance with the bad habit of our English entomologists, I may be mistaken on this point.

Acetalius dubius, n. s.

Angustulus, sordide testaceus, impunctatus, parce pubescens; prothorace elongato, ante basin transversim depresso, basi in medio longitudinaliter carinato; elytris ad humeros angustis, stria suturali, aliaque discoidali abbreviata. Long. $1\frac{1}{2}$ mm.

Antennæ with 1st and 2nd joints subequal, rather elongate in comparison with the following ones; 3rd quite small; the following ones small, very short; 6th

to 8th slightly, 9th and 10th strongly transverse; terminal joint disproportionately large, with acuminate extremity. Head depressed between the antennal tubercles, and curvedly depressed between the eyes; the vertex convex, simple. Thorax longer than broad, nearly straight at the sides, with excessively fine but distinct raised line extending from the base for nearly half the length, and so passing through the large transverse depression. The elytra are longer than the thorax, both the sutural and discoidal striæ are deep, at their origin excessively deep; the latter does not extend half the length of the wing-case.

The unique example exhibits no sexual marks.

Found among dead leaves at Suwa Temple, April 8th, 1881.

BRYAXIS.

Bryaxis princeps, Sharp.

Sharp, Trans. Ent. Soc. Lond., 1874, p. 119.

Mr. Lewis has found a series of this species near Nagasaki in March and April, showing that my opinion as to the sexes was correct; the male is constantly considerably larger than the female, and apparently much rarer.

Bryaxis alienus, Sharp.

Sharp, Trans. Ent. Soc. Lond., 1874, p. 120.

Two additional male individuals were found at Nagasaki in February and March.

Bryaxis cubitus, Sharp.

Sharp, Trans. Ent. Soc. Lond., 1874, p. 122.

A single male specimen was found, probably at Nagasaki, so that I am not able to throw any light on the difficult question as to the characters distinguishing the females of this and the allied species.

Bryaxis mundus, Sharp.

Sharp, *op. cit.*, p. 122.

Mr. Lewis has not brought back any other specimens that are certainly this species, but a few female individuals found about Nagasaki without any male apparently pertain to it. In my notice of the male characters

I have by error stated that the hind tibiæ are mucronate, whereas it is the middle legs that are so armed.

Bryaxis diffinis, n. s.

Rufulus, sat nitidus, brevissime pubescens, vix punctulatus ; prothorace trifoveolato, foveola mediali lateralibus minore. Long. $2\frac{1}{4}$ mm.

Mas, antennis articulo decimo magno, subgloboso, femoribus anterioribus subtus ultra basin denticulo minutissimo, tibiis intermediis apice intus unco brevi armatis ; abdomine segmento ultimo ventrali late impresso. Fem., antennis articulo decimo simplice, haud transverso.

This species is extremely closely allied to *B. mundus*, but the individuals are apparently slightly larger, and the head is rather more elongate, and the two fine plicæ on the 1st dorsal segment of the hind body are a little more distinct. The male has the 10th joint of the antennæ peculiarly formed, it being nearly globose, except that there is a very slight truncation of the anterior-inner edge, and its legs are stouter than in *B. mundus*. In the female the antennæ are longer than they are in the corresponding sex of *B. mundus*, the 3rd and 4th joints especially being longer, and the 10th about as long as broad.

Two pairs of this species were found at Yokohama.

Bryaxis pullus, Sharp.

Sharp, Trans. Ent. Soc. Lond., 1874, p. 123.

Neither this nor the two following species have been found again. Mr. Lewis has, however, captured at Yokohama three female individuals of apparently a distinct species, allied to *B. pullus*, and it appears probable that these red *Bryaxis* are numerous in species in Japan, and excessively difficult to distinguish apart from the male characters.

Bryaxis curtus, Sharp.

Sharp, *op. cit.*, p. 124.

Bryaxis crassipes, Sharp.

Sharp, *op. cit.*, p. 125.

Bryaxis latifrons, n. s.

Parum elongatus, niger, antennis, pedibus palpisque testaceis, elytris rufo-obscuris; capite brevi, vertice bifoveolato, cumque thorace dense punctatis, hoc trifoveolato, foveola mediali parva. Long. $1\frac{5}{8}$ mm.

Mas, antennis elongatis, articulo secundo magno, globoso, tibiis intermediis ante apicem intus spina tenui, elongata, libera armata. Fem. incog.

Second joint of antennæ broader than the 1st, globose; 3rd to 7th slender; 8th stouter than the preceding; 9th slightly transverse; 10th quadrate; terminal joint rather large. Head destitute of frontal impression. Elytra finely punctulate, with sutural and discoidal striæ,—the former does not quite reach the base; at the base between the two striæ there is a small fovea, both sutural and discoidal striæ being deep at their origin; 1st dorsal segment at the base with two fine distant lines.

This species is almost entitled to generic distinction on account of the form of the head, which is less rostrate in front, and destitute of anterior depression, the antennæ being very widely separated; the terminal joint of the maxillary palpi is rather small, and the structure of the male antennæ and middle legs is very peculiar.

Two individuals found at Miyanoshita, April, 1880.

Triomicrus, n. g.

Antennæ 11-jointed, widely separated at their insertion. Head trifoveolate, eyes with coarse convex facets. Maxillary palpi elongate; 2nd joint very long, nearly as long as the two following together, slightly narrowed or constricted beyond the middle; third joint with narrow base and oval extremity; terminal joint elongate and slender, between linear and oval in form, acuminate at the extremity. Trochanters short, though the intermediate and posterior femora do not touch the coxæ; hind coxæ widely separated, not prominent. Tarsi with a single elongate claw. Ventral segments in the male so abbreviated that the pygidium is scarcely separated from the metasternum. Abdominal margin small.

This genus seems allied to both *Tychus* and *Bryaxis*; it differs from the former by the structure of the head and palpi, and from *Bryaxis* by the peculiar palpi. It

has a great superficial resemblance to *Gerallus*, from which it differs by the more widely separated antennæ and the elongate single claw. To it is to be assigned *Bryaxis protervus*, which at the time of its description I indicated as a new genus; and now that Mr. Lewis has discovered a second species agreeing with it in the generic characters, it is better to separate it formally from *Bryaxis*.

Triomicrus simplex, n. s.

Rufus, nitidus, crebre pubescens; prothorace subgloboso, impunctato, trifoveolato; elytris parum punctatis, stria suturali aliaque discoidali elongata; abdomine segmento basali post elytrorum suturam vix perspicue foveolato. Long. 2 mm.

While the next species approaches in appearance (and in the structure of the head) somewhat to *Tychus*, *T. simplex* has quite the appearance of a *Bryaxis*, and is abundantly distinguished by the absence of punctuation on the head and thorax. The antennæ are moderately stout, with large 2-jointed club. At the base of the 1st dorsal segment behind the suture of the elytra there is only an obscure depression, and no raised lines.

The male has the terminal joint of the antennæ longer than the female, and the middle trochanters armed with a short truncate prominence; the metasternum simple.

A small series of this species was met with at Niigata on the 15th Sept., 1881.

Bryaxis protervus, Sharp.

Sharp, Trans. Ent. Soc. Lond., 1874, p. 121.

A few specimens of this species were found about Nagasaki in the early spring of 1881; February to April.

Bythinus.

Bythinus affinis, n. s.

Fulvus, evidenter pubescens, capite thoraceque dense punctatis, opacis, elytris parce, fortiter punctatis; palpis maxillaribus articulo ultimo elongato, fere gracili. Long. $1\frac{1}{4}$ mm.

Mas, antennis articulo basali incrassato, secundo parvo simplice, pedibus posterioribus fortiter incrassatis.

Extremely similar to *B. japonicus*, but with different male characters, and the thorax more coarsely punctate. In the male the basal joint of the antennæ is enlarged, so that it is broader and longer than it is in the same sex of *B. japonicus*, whereas the 2nd joint remains simple, being thus more slender than the 1st, instead of dilated, globose, and broader than the 1st, as is the case in *B. japonicus*; the hind legs are much more incrassate than in any individual I have seen of *B. japonicus*. The antennæ much resemble those of the female of *B. japonicus*, but the basal joint is larger and thicker, and the incrassate hind legs readily distinguish the male *B. affinis* from the female *B. japonicus*. The females of the two species are probably excessively similar.

A single male individual was found at Nagasaki, 6th April, 1881.

Bythinus japonicus, Sharp.

Sharp, Trans. Ent. Soc. Lond., 1874, p. 125.

A small series of about a dozen individuals was found about Nagasaki in March and April; and a single specimen at Miyanoshita. As is frequently the case with the European species of *Bythinus*, most of the individuals are females. The incrassation of the male hind legs is not very considerable in any of the few males found by Mr. Lewis.

Bythinus subseriatus, Weise.

Weise, Deutsche Ent. Zeit., 1877, p. 98.

Oshiroyama, Hagi (*Hiller*).

This species has not been found by Mr. Lewis.

Bythinus reversus, n. s.

Major, testaceus, longius pubescens; vertice prothoraceque crebre sat fortiter, elytris parcissime obsolete, punctatis; palpis maxillaribus articulo ultimo, elongato, fere gracili. Long. vix 2 mm.

Although only two female individuals in an immature condition have been found, this species appears to be a very distinct one. It has the maxillary palpi formed nearly as in *B. curtisi*, from which species it is very different by its much larger size and different punctuation. The antennæ have an elongate basal joint, about

as long as the three following together, the 2nd slightly more slender than the 1st, and not quite half its length; 3rd more slender and a little shorter than 2nd; 4th to 8th similar to one another, each about as long as broad; 9th slightly larger, also about as long as broad; 10th broader, transverse; terminal joint elongate and much pointed. Head with rather large eyes, and with a rather closely punctate vertex. Thorax not quite so long as broad, much narrowed behind, its surface with rather deep and distinct, but not close, punctures. Elytra only sparingly and indistinctly punctate. The larger size, more elongate basal joint to the antennæ, and obsolete punctuation of the elytra make the species easily distinguished from such others as have yet been found in Japan.

Nagasaki, June 1st, 1881.

PSELAPHUS.

Pselaphus debilis, n. s.

Depressus, latiusculus, subopacus, piceo-rufus, antennis pedibusque rufis, palpis testaceis, articulo ultimo apice breviter clavato; elytris quasi carinatis, seriebus duabus setarum. Long. 1½ mm.

Very similar in size and form to *Pselaphus revelieri*, though very different structurally, the margin of the hind body being flat and not elevated, and the elongate basal segment only about half as long as in *P. revelieri*; the maxillary palpi are excessively elongate and slender, with a small but rather abrupt club at the extremity. Head opaque, being densely and finely coriaceous. Thorax also opaque, small, rather broad (for this genus), though scarcely so broad as long, very evidently foveate in front of the base. Elytra narrow at the shoulders, greatly broader behind, not shining, but not so dull as the front parts; the suture slightly carinate, and each with two longitudinal ridges of very minute setæ, the outer margin with an obscure series of setæ. Hind body with a few distant setæ.

Mr. Lewis has found a pair of this species near Suwa Temple, the male on the 11th, the female on the 13th, April, 1881; the male is rather smaller and paler than the female, and has the apex of the metasternum

obscurely impressed, and the larger of the ventral segments with two very fine short ridges, causing it to appear foveolate on the middle between them.

Pselaphus lewisii, n. s.

Angustulus, rufo-testaceus, nitidus, palpis testaceis, articulo ultimo longius clavato, parcissime setulosus; elytris stria suturali aliaque discoidali obsoletis. Long. $1\frac{3}{4}$ mm.

This species is not very dissimilar from the well-known European *P. heisei*, except that it is very much narrower, and is entirely destitute of the two peculiar pseud-ocelli seen between the eyes of *P. heisei*; the antennæ and palpi are similar to those of *P. heisei*, the club of the last joint of the latter being more than half the length of the joint. The thorax is very shining, and without fovea. The elytra and hind body are very similar to those of *P. heisei*, except that the sutural and discoidal striæ are less distinct.

A single example, probably a female, was found at Nagasaki on the 28th May, 1881.

Diartiger, n. g.

In this genus of *Clavigerini* the insect possesses eyes, and has the antennæ 4-jointed; the 1st joint is very short, globose, and is only imperfectly separated from the very short 2nd joint, which is a little narrower and a little shorter than the globose basal joint, and projects just a little out of the cavity of the head; the 3rd joint is slender and elongate, evidently thicker, however, towards the extremity, and is quite three times as long as the breadth at the extremity; it is deeply divided from the 4th joint, which is rather elongate, becomes gradually broader towards the extremity, which is abruptly truncate; it is longer than the 3rd joint. This is a similar disposition of the antennæ to what would exist in *Fustiger fuchsii*, if the terminal joint of that insect were deeply divided into two near its middle.

From *Clavigerodes*, Raff., which is stated by Reitter to possess 4-jointed antennæ, *Diartiger* is distinguished by the fact that it has only two exserted antennal joints; from an inspection of a specimen of *Clavigerodes abyssinicus* I entertain, however, little doubt that, if we

adopt Mr. Reitter's view that the antennæ are 3-jointed in *Fustiger*, we must consider them to be 5-jointed in *Clavigerodes*.

The description above given of the antenna of *Diartiger* may be relied on, as it has been made from an antenna disarticulated by cutting off the corner of the head with an antenna attached, and then cutting away the portions of the head till the base of the antenna is cleared and left intact. By the same mode of treatment *Claviger* displays apparently a 6-jointed antenna, the 2nd joint being, however, as in *Diartiger*, separated not by a true articulation, but only by a constriction from the 2nd joint, and it would perhaps be more accurate to treat these two minute basal portions as being really only one articulation.

Diartiger fossulatus, n. s.

Rufescens, tenuiter flavo-setosus, elytrorum apice abdominisque latere ad basin dense flavo-pubescentibus; capite, thorace elytrisque dense subtiliter punctatis, haud nitidis, abdomine nitido, basi in medio fovea maxima impressa. Long. 2 mm.

Mas, pedibus intermediis trochanteribus longe, femoribus breviter, spinosis, tibiis lateraliter compressis, intus ad medium dente minimo instructis.

Very similar to *Claviger foveolatus*, but smaller and more slender, with the head, thorax, and elytra more densely punctate, the latter longer. The head is as long as, but much narrower than, the thorax; the latter is smaller, rather longer than broad, deeply foveate at the base; the elytra are much longer than the thorax, very finely punctulate, with a rather close, very fine, depressed pubescence.

This insect was found in company with a species of *Formica ?* at Hakone and Miyanoshita in May, 1880; Shimabara and Fukuhori, near Nagasaki, are also localities for it. A few specimens were found at Futai on the 20th Sept., 1881, in company with the same species of ant; and a single individual of a rather more elongate form and darker colour was found at Hitoyoshi in the month of May.

Diartiger spinipes, n. s.

Rufescens, tenuiter flavo-setosus, elytrorum apice abdominisque latere ad basin dense flavo-pubescentibus ; capite thoraceque dense, elytris parce subtiliter, punctatis ; abdomine nitido, longius setoso, basi in medio fovea maxima impressa. Long. $2\frac{1}{4}$ mm.

Mas, pedibus intermediis, trochanteribus spina perelongata, femoribus spina elongata curvata, tibiis lateraliter compressis.

This species appears to be closely allied to *D. fossulatus*, but the individual before me is rather larger than the largest of that species, has the antennæ slightly more elongate, the elytra much more sparingly punctate, and the spines on the middle legs of the male of remarkable elongation. In *D. fossulatus* a well-marked patch of golden pubescence extends along the middle of the breast in each sex, but is more conspicuous in the male ; in the male of *D. spinipes* this pubescence is absent, and the hinder part of the metasternum is broadly impressed.

A single individual was found at Yuyama, May 10th, 1881.

XIII. *On the* Lucanidæ *of Japan.* By George Lewis.

[Read July 4th, 1883.]

Plate XIV.

There are fifteen species of *Lucanini* and one species of *Passalini* known now from Japan, and the list of these, with their synonymy, stands, I believe, as follows:—

Lucanini.

Lucanus maculifemoratus, Motsch.
= *sericans*, Voll.
= *Hopei*, Parry.
Cladognathus inclinatus, Motsch.
= *mandibularis*, Thoms.
= *inflexus*, Harold.
Prismognathus angularis, C. Waterh.
Eurytrachelus platymelus, Saund.
= *castanicolor* (*Serrognathus*), Motsch.
Macrodorcus rubrofemoratus, Motsch.
,, *montivagus*, n. s.
,, *rectus*, Motsch.
= *Niponensis*, Voll.
= *diabolicus*, Thoms.
= *rugipennis*, Motsch.
Macrodorcus striatipennis, Motsch.
= *binervis*, Motsch.
= *cribellatus*, Motsch.
= *opacus*, C. Waterh.
= *Vanvolxemi*, Lewis.
Dorcus Hopei, Saund.
= *binodulosus*, C. Waterh.
Ægus subnitidus, C. Waterh.
Platycerus delicatulus, n. s.
Figulus binodulosus, C. Waterh.
,, *punctatus*, C. Waterh.
Ceruchus lignarius, n. s.
Æsalus Asiaticus, n. s.

Passalini.

Aulacocyclus patalis, n. s.

There is no *Sinodendron* known yet from Japan.

In this list I have omitted *Lucanus Cantori*, Hope, and *Prismognathus dauricus*, Motsch., because the evidence of their being natives of Japan seems to me insufficient. *Lucanus Cantori* is a native of Assam, and although Motschulsky says, in the 'Etudes' of 1860, that Madame Goschkevitch obtained it in Japan, in the 'Etudes' of 1861, in treating of the same material, he gives us, without any reference to *Cantori*, *maculifemoratus*. His first determination thus appears incorrect, and the specimens available to-day from Japan confirm this. By the kindness of Major F. J. S. Parry I have been able to examine specimens of *Prismognathus dauricus* from the mainland of Asia. Motschulsky described this in 1860, but his remarks in

the 'Etudes' of the next year apply, as I conceive, to *angularis*; yet there can be no doubt that the insects are specifically distinct.

Major Parry has also kindly pointed out to me that *Serrognathus castanicolor*, Motsch., is an immature male example of *Eurytrachelus platymelus*, Saunders. In 1874 Dr. Renard sent Major Parry a drawing of Motschulsky's type, made by Professor Lindemann, and the drawing, which I have seen, at once disclosed the fact that these two names apply to the same insect.

It will be seen from the synonymy of the list and the remarks above that some little confusion has arisen in the determination of the species of the group generally, and this has been owing chiefly to the want of sufficient material by early authors, for had they had a long series they would have been able to discriminate between the forms which compose a species and the species themselves.

To enable the student of *Lucanidæ* rightly to estimate the value of the different forms which usually exist in, and partly constitute the peculiarities of, a species, it is of all things necessary that he should possess and carefully examine a long series of specimens of each kind, for each species is subject to great and apparently divergent modifications of the members composing it, especially in the males. Often the largest form, and a form midway between it and the smallest form, are the most abundant in individuals, and most constant in size and structure; while the intermediate and connecting forms are scarce, or even of great rarity. But I have said apparently divergent because there are not, as it might first appear, various forms, for all are developments of one type depending on the amount of growth of some or all parts of the individual. There is no tendency towards any (comparatively speaking) permanent divergent line beyond what we can trace to the result of size and individual vigour of constitution; for, in the Japan insects at least, it is merely a matter of finding the intermediate links before a complete series can be arranged bridging over all the individual differences.

Now these remarks must be applied chiefly to the larger species of the family contained in the genera *Lucanus*, *Cladognathus*, *Dorcus*, and *Macrodorcus*, for when we arrive at the genus *Platycerus* we find but little in

the way of variation which extends beyond what we observe in many other insects. There are the sexual differences of the family and little more, and *Figulus* also follows in the same line, but has no external sexual characters to speak of. We see, then, that the vigorous forms of the family (*Lucanus*) have acquired a sexual development which is not shared in by the smaller forms (*Figulus*).

The *Lucanidæ* of Japan are all reared in decaying trees, and the variation which occurs in the individuals of their species relates chiefly to size, and can, I think, only be traced to the feeding of their larvæ. The larval condition of insects is the stage of growth; the period from the egg to the pupa is the time when an insect increases in size and weight, and it is certain that many of the eggs deposited in summer will be laid on such parts of decaying trees which are too hard, or perhaps too rotten, for the larvæ to thrive on. And even more than this, they may be laid on trees of harder texture or closer fibre than is essential for the highest development of the larvæ; and many larvæ of *Lucanidæ*, as in other insects, die simply of starvation at the first or at another early stage. Small varieties of a *Lucanus* are to me simply those forms which escape starvation, and yet are emaciated by poverty of food, and each individual increases in stature, in proportion to the nutriment of its food, until it reaches the form *maximus*. A familiar case to us all of the result of nutritious diet is the queen bee, and last year Mr. Pryer gave us another instance in drawing attention to Japan Papilios.

Sometimes in a northern country we find insects which have affinities in the tropics, and we see that the northern forms are much larger than their southern congeners. As an example, take *Rhysodes*. The Japan species is half as large again as the Ceylon species, because the first lives in beeches, elms, and oaks, while the second feeds in the hard-wooded tropical trees, which are, as I believe, less nourishing. (Trans. Ent Soc. Lond., 1882, pp. 476 and 482).

But we need not depart from the *Lucanidæ* for an example of this, as the *Lucanidæ* themselves are rare in the Ceylonese jungle, and many hundreds of specimens can be collected in a summer day in Yezo, where deciduous trees are the rule and not the exception. As regards the *Platycerus*, it being of a small size, the

larvæ can get sufficient nutriment where a larger species would starve, and this is perhaps enough to account for its constant size and moderate sexual differences. Even in *Macrodorcus*, the *rubrofemoratus* is more constant in size than some of the others, and on the 8th June, 1880, I took, at Chiuzenji, fifty specimens from a single beech, and into this tree my axe was easily driven four or five inches by a fair blow. The larvæ here could penetrate the whole tree, and obtain such nutriment as was necessary for normal development, and under these conditions there was no conspicuous variation in the size of the imagos. The *Prismognathus* again, which varies but little, feeds in rotten birch trees, a tree which, like the beech, rots quickly away, and is different in this respect both to the oaks and to the tropical hard-wooded trees, which only decay by inches at a time.

The larva of a *Cicindela*, *Carabus*, or *Dytiscus* has the power and habit of seeking food, and can generally obtain what is necessary; but wood-feeding larvæ, such as those of *Lucanidæ* and *Cerambycidæ*, the imagos of which vary so much in size, are almost wholly dependent on the incident of the whereabouts a certain female may deposit her ova: if on or near very hard wood they are starved; if on more nutritious material they become vigorous. Roughly speaking, in a *Cicindela* the size is constant and normal, and in a *Cerambyx* variable and irregular. A tree-larva, while feeding and coming on a hard knob or nodule, may become starved or emaciated, but a ground-feeding species is not isolated in the same way, and the evidence of its better position is that it varies less in bulk and stature.

It thus appears probable that when a species, during a long series of generations, has lived (without the exertion of finding it) amidst an abundant, but occasionally variable, supply of easily assimilated food, it has acquired a superior stature for its individuals, the acquisition of which carries with it a capacity of special sexual development. And at the same time the species obtains to a greater plasticity than in other kinds, which enables it under less favourable circumstances to continue to preserve its species through the instrumentality of individuals of lesser development. But the idea that these small specimens indicate a retrograde movement towards a primitive form is, I think, contrary to the general principles of Nature's workings; because,

although we may say it is by heredity that the *Lucanidæ* retain their ordinary peculiarities, the strange excrescences and huge mandibles in some males is a result arising from the necessity of placing the tissue gathered by a vigorous larva in becoming full-fed. It is of individual, not specific, value. It is a process within a single organism, as in the queen bee, resulting in an abnormal development.

In the following notes of species I have given the number of specimens in my collection, as I think it an important statistic; but in the forests of Japan I have examined many hundreds of specimens of the commoner kinds in the living state, and had it been otherwise I should hardly have been able to unite such insects as *Macrodorcus opacus* with *striatipennis*, nor could I have sunk with confidence other names relating only to forms of parallel value.

Prismognathus angularis, C. Waterh. (Pl. XIV., fig. 1).

The type of this species, female, I obtained in Kawachi in 1871. Lately I obtained ten males and two females, all from old birch trees or logs.

The localities are Chiuzenji, Junsai, and Sapporo, and the specimens only show slight variation in size and form.

Macrodorcus rubrofemoratus, Motsch.

This is a very distinct species; in the south of Japan it occurs only at very high elevations, but in Yezo it is common at sea-level. It was most abundant in the beech forests above the Lake of Hakone, and at Chiuzenji; and it was found also in Kiushiu on Oyayama.

Twenty males, eleven females.

Macrodorcus montivagus, n. s. (Pl. XIV., fig. 2).

♂. Niger, opacus, undique minute punctulatus, mandibulis capitis longitudine, robustus arcuatis, ante medium dente acuto armatis. Prothorace transverso, lateribus post medium dente acuto instructis. Long. cum mandib. 18—19 lin.

♀. Capite fortiter rugoso, medio bituberculato;

medio nitido, parce punctulato lateribus rugulosis. Long. cum mandib. 18 lin.

Six males, eight females.

I have figured the male of this, and I should not have ventured to describe it as other than a variety of *striatipennis* or *rectus* were it not so evidently a small development of a species. The punctuation of the mentum agrees fairly with *rectus*, but it is more vermiform and confluent. The female is so large that a fully-developed male must be very much larger than the form I know. It is a scarce species, and I obtained only a few specimens, and these all occurred at sap where the large *Hepiali* were feeding. Chiuzenji, Junsai, and Nanaye are the localities.

Macrodorcus striatipennis, Motsch.

I found this species in immense profusion in Yezo, and in all the elevated forests of the main island. It is not common in Kiushiu, but I have specimens from Oyayama and Tanegashima.

Dorcus Hopei, Saunders.

This species is apparently rare; large males measure over 31 lines. I obtained it at Kobè, Kioto, and Sendai. Seven males, three females.

D. binodulosus, C. Waterh., is an undeveloped male of 17½ lines.

Ægus subnitidus, C. Waterh.

This has its affinities in tropical species; it is common in Kiushiu in fir "stools," but it only occurs as far north as Kioto, and is rare there. It has its large and small forms. Thirteen males, five females.

Platycerus delicatulus, n. s. (Pl. XIV., fig. 3).

♂. Nigro-cæruleus, subnitidus, capite thoraceque sat fortiter punctatis, mandibulis capitis longitudine. Antennis nigris. Elytris tenuiter striatis et rugoso-punctatissimis, pedibus testaceis, his geniculis nigris. Long. 6½ lin.

♀. Æneus, seu nigro-cæruleus, tibiis plerumque solum testaceis. Long. 5½ lin.

Twenty-five males, twenty females.

Above blue-black, rather shining, rather parallel; beneath black. Head rather thickly and strongly punctured; clypeus smooth, excrescences in front of eyes prominent; mandibles black; when closed the basal teeth close on to the clypeus, and nearly touch each other. The upper part of each tooth forms a ridge, which extends along the mandible, forming a medial carina. The punctuation of the thorax is rather finer than that of the head, and in shape and dilatation at sides agrees with *P. quercus*, Weber; scutellum is smooth at the base; elytra sculptured in the usual form of the genus. The legs are testaceous; knee-joints and front tibiæ black; tarsi pitchy.

The female is more variable in colour, being brassy, brassy green, and blue-black, with the middle and hind tibiæ only generally pale; but I have specimens with wholly red legs, and one with legs entirely black.

P. delicatulus is of more slender form than *caraboides*, and the elytra are somewhat more depressed in the front of the middle, with the apical callosities more prominent. The sculpture, too, is considerably finer; in the male the apical teeth of the front tibiæ are but little developed, and the crenulations above them are remarkably regular, there being an absence of any tooth standing out from the rest in a prominent manner. The middle tibiæ also are without any external teeth.

Found in June at Oyayama, Odaigahara, Chiuzenji; and on Ontake in August.

Figulus, like *Ægus*, is a tropical genus. I took twenty specimens of *F. binodulosus*, C. Waterh., at Konose in May, 1881, from an old log in the forest; all the specimens are alike and agree well with Waterhouse's type and description. Of *F. punctatus* I obtained only one specimen from an old Celtis at Nagasaki in February, and I believe it is a good species. There are five specimens in my original collection.

Ceruchus lignarius, n. s. (Pl. XIV., fig. 4).

Niger, nitidus, capite utrinque rugoso, in medio sparse punctato, fronte in medio excavato, prothorace punctato apice læve marginato; elytris striatis, interstitiis sparse punctatis. Long. cum mandib. $7\frac{1}{2}$ lin.

♀, mihi ignota.

Three males.

Pitchy black, shining; mandibles punctured like the head;* head excavated in front behind the clypeus, very rugose at the sides, smooth in middle, with rather large scattered punctures on the disc. Thorax transverse, more finely punctured than the head, with two shallow foveæ on each side. The margin in front is smooth, at the sides narrowly raised, reflexed at the posterior angle, and continued round the base. The interstices of the elytral striæ are punctured like the thorax.

I obtained two examples at Sapporo early in August, 1880, and one (dead) under a stone on Niohosan the following year. From the numerous fragments I saw of it amongst stored timber at Sapporo I concluded that it must be common there in early summer.

Æsalus Asiaticus, n. s. (Pl. XIV., fig. 5).

Ovalis, niger opacus rugose sculpturatus, squamis brunneis plus minusve dense variegatus, maculisque tomentosis erectis nigris. Long. $2\frac{1}{2}$—$2\frac{3}{4}$ lin.

Seven males, thirteen females.

Oval, rather convex, opaque, very roughly sculptured, and more or less clothed with brown scales. Beneath the scales there is a surface with distinct, rather shallow and somewhat irregular, punctures. Forehead depressed. Thorax has a medial line free of scales or setæ, and on each side are two clumps of thick black setæ, and above the last an ill-defined crescent of the same. The elytra have, including a sutural line, fine lines of black spinose maculations, which give a clear tesselated appearance. The sexual characters are the same as in *Æ. scarabæoides* of Europe.

This species is interesting as being a second species in a remarkable genus. The individuals are considerably smaller than those of *scarabæoides*, and the black tomentum, forming well-marked separate spots or patches on the elytra, give *asiaticus* quite a different appearance. Not knowing the genus *Æsalus* when I first took the species, I thought it was one of the *Colydiidæ*.

This little species occurs in large forests of considerable elevation. I obtained it first in May, 1880, above Miyanoshita. I took off bark from a fallen tree which was

* Each mandible is as long as the head, reflexed, with two teeth, one basal the other ante-medial, and in this respect is nearer the American *striatus* than the European *tenebrioides*.

dead and moss-grown, and then found it in little round holes it had gnawed out in the wood under the bark to winter in. In June I found it at Chiuzenji, and the following spring on Oyayama, near Kumamoto, always getting it in the way described.

Aulacocyclus patalis, n. s. (Pl. XIV., figs. 6, 7).

Convexus, parum elongatus, niger nitidus, capite dilatato, utrinque lamina erecta, apicem versus latiore, margine superiore emarginato. Prothorace convexiusculo minutissime punctato, anteriore in medio binoduloso, dorso canaliculato; elytris striis punctatis, interstitiis convexis. Long. $8\frac{1}{2}$—9 lin.

Twenty-five specimens.

Convex, black, shining; head impunctate and dilated; the outer margins at each side are produced into robust spreading horns, and the anterior angles of the head are acute and prominent, with a carina running back from them and half crossing the eye. The thorax is smooth, with very fine scattered punctures, emarginate at the sides and base. Anteriorly the middle is produced into two rather prominent nodules; the elytra are very convex for this genus, and deeply punctate-striate with convex interstices. There is no external difference in the sexes. In the genus *Nigidius* the frontal carina completely crosses the eye, dividing it in the middle.

This species is very distinct from any other yet known, and perhaps later a new genus should be formed for its reception. But it would not be easy to define it at present owing to the want of some of its nearest allies for comparison, and the fact that Kaup's genera of *Passalini* are somewhat vaguely characterised. *A. platypus*, Kaup, from Thibet, of which there is a series in the National Collection, is the nearest species I know to it.

I took twenty specimens on the 11th May, 1881, in three or four decaying hard-wood trees of three feet girth, which had been blown down and had remained five or six years under shade of a dense forest above Yuyama, on the western side of Ichibosayama. The bark came off easily in the hand, and the specimens were resting, after the manner of *Passalini*, in the black wood-mould it had covered. A native collector the next year obtained a few more on the same spot. I found *Passalini* in Ceylon in corresponding abundance to the *Lucanini* in Yezo.

Explanation of Plate XIV.

Fig. 1. *Prismognathus angularis*, C. Waterh. ♂.
2. *Macrodorcus montivagus.* ♂.
3. *Platycerus delicatulus.* ♂.
4. *Ceruchus lignarius.* ♂.
5. *Æsalus Asiaticus.* ♂.
6. *Aulacocyclus patalis.*
7. Ditto, side view of head.

XIV. *On* Ogyris Genoveva, *Hewitson, and its life-history.* By W. H. Miskin.

[Read July 5th, 1882.*]

Plate XV.

This species was first made known by the late Mr. Hewitson, who was, however, acquainted with the female only, which he figured and described in his 'Exotic Butterflies.'

In this, as in the other species of this very rare genus, the individuals are few and far between, being extremely local in their habits.

My friend Mr. George Barnard, of Coomooboolaroo, has, however, been so extremely fortunate as to penetrate the mystery of its metamorphosis, and has kindly communicated the particulars to me for publication, and the obligation is doubly enhanced by the accompaniment of figures of individuals of both sexes, variety of the female, larvæ and pupa, as also the food-plant, beautifully executed by the pencil of Mrs. Barnard, and which supplement this paper.

I am now in a position to make known to Science the complete history of this the finest species (excepting the somewhat aberrant, if not doubtful, *Liphyra Brassolis*, Westw., which, by the way, is probably not hitherto known to be Australian) of the whole family (*Lycænidæ*); as also the hitherto undescribed male and variety of the female.

LEPIDOPTERA.

LYCÆNIDÆ, *Stephens.*

Ogyris, *Westwood.*

Ogyris Genoveva, Hewitson.

Hewitson, Ex. Butt., i., pl. 48, figs. 5, 6.

Male.—Upper side: Dense purple, inclining to violet, somewhat darker towards outer margins; marginal

* Publication delayed owing to miscarriage of drawings.—E. A. F.

fringe white. Primaries with three short oblique white dashes at apex of costa. Secondaries with outer and hinder margins deeply dentated, anal angle somewhat spatulate; termination of 3rd median nervule prolonged into a decided tail. Abdominal margin brown. Thorax and abdomen black. Under side: Primaries, basal and discal areas dull black; apical angle and part of the outer margin grey; six transverse discal bands of silvery blue, and one beyond cell larger, whitish. Secondaries grey, with numerous transverse waving double black lines. Thorax and abdomen grey. Expanse, 2 inches.

Female.—Upper side: Black; base of both wings, extending on the secondaries to anal angle, and faintly to termination of 1st and 2nd median nervules, light silvery blue; marginal fringe white. Primaries with an oblique apical, somewhat curved, band of pale yellow; two faint white oblique short dashes at apex of costa. Secondaries dentated and tailed as in male; the 1st median nervule rather more developed; abdominal fold very light brown. Thorax and abdomen greyish brown. Under side: Primaries as in male, except for the broad apical band of light yellow. Secondaries also as in male, but with the addition of a broad lightish transverse band from about centre of costa half-way across wing, and patches of ashy brown intermingled with the grey. Thorax and abdomen grey. Expanse, 2 inches 4 lines.

Var a. *Female*.—With the basal area violet, not extending so far into the wings as does the blue in the typical female. Expanse, 2 inches 5 lines.

Hab. Brisbane; Dawson River (*Barnard*); Queensland.

As I have not myself seen the larva and pupa, I reproduce my friend Mr. Barnard's description and remarks:—

"*Larva*.—1 inch to 1 inch 2 lines, subonisciform when at rest, but flattening out considerably when in motion; attenuated posteriorly; anterior segments retractile; ochreish yellow; base of each segment on the back dark brown; head reddish brown, hidden by the projecting 2nd segment; spiracles black; each segment at side and apex of posterior segment produced into a small fascicle of white bristles.

"*Pupa.* — 9 to 10 lines, dull black, smooth and rounded, with the usual central girth.

"The larva, which is nocturnal in its habits, feeds upon *Loranthus* sp., descending and remaining beneath the surface of the ground during the day, where also it undergoes its changes, fastening up to projections of wood at the foot of the tree which bears its food-plant, immediately under the surface. It is social in its habits, numbers in all stages and of various ages being found together.

"It apparently secretes some sweet substance, being invariably attended by numbers of large ants (a peculiarity common to other of the *Theclinæ*, as I have observed the same thing occur with *Ialmenus Evagoras* and *I. Ictinus*).*

"The imago makes its appearance from November to April."

Explanation of Plate XV.

Fig. 1. *Ogyris Genoveva*, ♂.
2. ,, ,, ♀.
3. ,, ,, ♀, var.
4. ,, ,, larva.
5. ,, ,, pupa.

The plant is *Loranthus* sp.

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* Ants are known to attend on the larvæ of several European and North American species of *Lycæna* for the sake of a sweet secretion. *Vide* W. H. Edwards, Canad. Ent., x., pp. 1—15 131—136, 160 (1878).—W. F. K.

XV. *Descriptions of twelve new species of South-African* Lepidoptera-Rhopalocera. By Roland Trimen, F.R.S., &c., Curator of the South-African Museum, Cape Town.

[Read June 6th, 1883.]

The species here described comprise one member of the *Nymphalidæ*, six of the *Lycænidæ*, two of the *Papilionidæ*, and three of the *Hesperidæ*. Seven of them will be figured in my new work on the South-African Butterflies.

The most remarkable among these new species is *Lycæna stellata*, one of the smallest of known forms, in which the ordinary pattern of the under side of the wings is in both sexes distinctly outlined in white on the very dark upper side. *D'Urbania saga* is a very distinct and interesting addition to a genus hitherto represented by a single species.

NYMPHALIDÆ.

NYMPHALINÆ.

Precis, *Hübn.*

Precis Sesamus, n. s.

Exp. al. 2 in. 5—11 lin.

Closely allied to *P. Amestris*, Drury.

Black, irrorated and transversely banded with violaceous-blue; a common discal row of conspicuous red spots. Fore wing: Basal area thickly irrorated with blue, crossed by five black streaks in discoidal cell; discal row of four red spots (surmounted near costa by two small round white spots) between two blue bands, of which the inner one is continuous and irregularly excavated along its internal edge, and the other one regular but macular; a series of bluish-white lunules along hind-marginal edge. Hind wing: Bands and basal irroration much as in fore wing, but inner blue band soon merges in basal blue, and outer one is continuous;

six or seven red spots in discal row. Under side: Glossy dark greenish bronze, with transverse fuscous striæ corresponding in position with the black portions of the upper side; a discal row of small fuscous rings (of which the third from the costa of fore wing is filled with white). Fore wing: Two lower red spots of discal row present, but much paler and less defined than on upper side. Hind wing: Basal area crossed by three or four much broken irregular fuscous striæ. Cilia, above fuscous, with white internervular markings; beneath much more obscure, especially in hind wing.

This southern representative of *P. Amestris* is readily separable by (1) its larger size, (2) its conspicuous basal blue irroration, (3) the constancy and large development of the inner discal blue band, (4) the less irregular discal row of red spots, (5) the absence of red striæ in discoidal cell of fore wing, and (6) the uniform dark bronzy-green tint of the under side, without any representation of the red spots of the upper side, except near the inner margin of the fore wing.

Hab. Cape Colony (Eastern Districts), Kaffraria Proper, Natal, Transvaal, and as far north as the Zambesi River.

LYCÆNIDÆ.

LYCÆNA, *Fab.*

Lycæna lucida, n. s.

Exp. al. 8½ lin.—1 in. ½ lin.

Allied to *L. Lysimon*, Hübn.

♂. Pale violaceous, inclining to pink; nervules more or less defined with greyish brown; cilia whitish, much obscured with brownish in fore wing, and varied with it in hind wing. Fore wing: An indistinct thin brownish disco-cellular lunule; a greyish-brown hind-marginal border of variable width, usually ill-defined inwardly. Hind wing: A hind-marginal row of six small internervular fuscous spots. Under side: Pale grey, tinged with brownish; spots of bases and discs very distinct, black, in white rings; beyond ordinary discal row a row of sagittate white marks, succeeded by two hind-marginal rows of white lunules almost forming internervular rings. Fore wing: Two spots near base, one in cell, the other below it; discal row of spots

strongly incurved on 2nd median nervule. Hind wing: A spot at base; a transverse row of four spots before middle; discal row strongly elbowed on 2nd subcostal nervule; a straight white ray runs longitudinally along radial nervule from disco-cellular terminal lunule as far as row of sagittate white marks; near anal angle, two small blackish spots enclosed by lunules of the two hind-marginal rows.

♀. Dark brown, usually more or less marked with violaceous on lower part of discs and towards bases. Hind wing: Dusky spots of hind-marginal row, as in male, more or less apparent in violaceous-marked specimens. Under side: Usually a little more brownish than in male; the spots even more distinct, and the white ray of hind wing broader.

This insect may be distinguished from *L. Lysimon* by the much more conspicuous spotting of the under side with the white ray exhibited by the hind wing. The male also differs in the decided pink tinge of the upper side, and in the absence of the dusky border of the hind wing. The female has the upper side much darker than in *L. Lysimon*, and the violaceous colouring is deeper and not of so blue a tint.

Hab. Cape Colony, Kaffraria Proper, Natal, and Transvaal.

Lycæna stellata, n. s.

Exp. al. 7—9 lin.

Greyish fuscous, with numerous subannular and other white spots arranged in correspondence with those of the under side. Fore wing: Terminal disco-cellular annulet, and discal inferiorly much-incurved band of annulets, enclose spots somewhat darker than ground colour; two similar annulets near base, one in cell, the other below it; a submarginal row of six minute white spots; cilia broad, fuscous, with narrow but very distinct white internervular interruptions, those close to apex and to posterior angle wider than the rest. Hind wing: An indistinct annulet near base below cell; other markings as in fore wing, but not so pronounced; in submarginal row of small white spots the first is considerably larger than the others; cilia broad, white, with imperfect fuscous nervular interruptions. Under side: Pale brownish grey, the white annulets enclosing

fuscous spots. Fore wing: Markings very distinct; discal row of annulets commencing about middle with two very small costal ones; submarginal row of minute white spots black-edged on both sides; fuscous of cilia paler than on upper side. Hind wing: An annulet at base; a subbasal transverse row of four annulets, that on costa enclosing a spot darker than the rest; 1st and 2nd annulets of discal band separate from succeeding ones and nearer base; submarginal row of minute white spots rather indistinct, but their inner black edges well marked, subsagittate; the 1st and 2nd of these spots are out of line with and before the others.

Like *L. lucida*, this butterfly belongs to the *Lysimon* group, both in form and in the pattern of the under side; but the upper side in both sexes is quite unlike that of any member of that group, or indeed of the genus *Lycæna*, presenting as it does, on a blackish ground, the under side pattern in finely-depicted white annulets and spots. In the total absence of blue in both sexes, and in its very small size, *L. stellata* resembles *L. Metophis*, Wallengr., and *L. Barberæ*, Trim., but its under side is altogether different, and quite wants the row of metallic-dotted ocelli so conspicuous in the hind wing of those two species.

This very remarkable little butterfly was discovered by Dr. D. R. Kannemeyer, near Burghersdorp, in the north-east of the Cape Colony, in November, 1882. He describes it as being numerous in a damp spot of a few yards in extent, flitting about low flowers in a circular direction.

Hab. Burghersdorp (Albert District), Cape Colony.

Lycæna puncticilia, n. s.

Exp. al. 1 in.—1 in. 3½ lin.

Closely allied to *L. Methymna*, Trim.

Dark brown, with a slightly æneous surface gloss; cilia dark brown, with rather small but very conspicuous pure white internervular spots. Hind wing: In some female examples, along hind-marginal edge, a row of minute internervular white spots, only separated from the white spots of the cilia by a blackish bounding line. Under side: Dull ashy brown; ordinary discal row of

darker white-edged spots indistinct, or sometimes obsolete, except for the thin internal white edging; adjoining the conspicuous white spots of the cilia a row of elongate-ovate white rings, usually better marked in fore wing than in hind wing. Fore wing: Spots of discal row confluent into a nearly straight fascia, slightly bent inward on median nervules; beyond this traces of a row of thin sharply-sagittate white marks. Hind wing: First and last spots of discal row ovate, black, white-ringed; other spots of row confluent, suffused; a subbasal transverse row of three round black spots in white rings; beyond discal row a conspicuous, very acutely dentated, white transverse line composed of contiguous sagittiform marks; on hind margin, between 1st and 2nd median nervules, a small indistinct blackish spot centred with a few bluish-white scales.

Separable from *L. Methymna*, Trim., by (1) darker upper side, without any reddish tinge; (2) absence of disco-cellular lunule on upper side of fore wing; (3) darker, more ashy under side, with (4) less distinct and less macular discal row; (5) more elongate and distinctly defined white rings of hind-marginal row; and (6) more conspicuous and acutely dentated white transverse line in hind wing.

Taken in some abundance at and near Malmesbury, a village some miles to the northward of Cape Town, by Colonel Bowker and myself.

Hab. Cape Colony (Western Districts).

Lycæna Bowkeri, n. s.

Exp. al. 1 in. $1\frac{1}{2}$—$2\frac{1}{2}$ lin.

Allied to *L. Thespis*, Linn.

♂. Silky lilacine-blue; each wing with a rather large blackish lunular mark closing discoidal cell, and a moderately wide macular blackish hind-marginal border; cilia broad, black, conspicuously interrupted with white between nervules. Hind wing: The spots composing hind-marginal border more separated than in fore wing (especially near anal angle), and immediately preceded by contiguous thin whitish lunules. Under side: Yellowish white; each wing with disco-cellular lunule, irregular interrupted discal row of spots, and submarginal row of smaller subquadrate spots,—all pale

ochreous-brown, finely edged, internally and externally, with blackish; close to hind margin a row of very distinct sublunulate black spots. Fore wing: A longitudinal brown stripe from base (where it is almost black) along subcostal nervure to a little before and above extremity of discoidal cell; three small ochreous-brown spots near base (one in cell); discal row of spots abruptly interrupted on 2nd median nervule; costa from before middle to apex edged with blackish. Hind wing: Curve of costal edge close to base black; an irregular basal marking composed of three or four contiguous small ochreous-brown spots; subbasal row of three spots much as in fore wing; an additional spot on inner margin near base; discal row abruptly interrupted on 2nd subcostal nervule, and thence angulated in almost a direct line to about middle of inner margin; the 7th (and very slightly the 8th) black spot of hind-marginal row dotted with silvery blue.

♀. Only the basal and inner-marginal area of both wings, and the hind-marginal region of hind wing, lilacine-blue, the disc being white in both; terminal discocellular spot and irregular discal row as on under side, but black and strongly marked; row of violaceous-whitish lunules internally edging hind-marginal blackish spots more conspicuous than in male in hind wing, and also indistinctly marked in fore wing. Under side: As in male, but all the spots somewhat sharper and clearer in outline.

This interesting species is in the male distinguishable from *L. Thespis*, by (1) the much less vivid more lilacine-blue, and (2) much wider hind-marginal blackish border of the upper side; and in the female by (3) the much more developed discal white (especially in the hind wing) and hind-marginal lunulate markings. On the under side both sexes display (4) a whiter ground, (5) smaller and more clearly-defined markings, and (6) much more conspicuous and black spots of hind-marginal row. The tail of the hind wing is in both sexes longer than in *L. Thespis*; and in this character, as well as in those of the under side just noted, *L. Bowkeri* exhibits indications of alliance with such congeners as *L. Sybaris*, Hopff., and *L. Hintza*, Trim.

Colonel Bowker, to whom I dedicate this species, captured four examples early in the year 1881, on the

summit of a high hill overlooking the Inchanga Valley in Natal. He took two of each sex, and notes that they were flitting about the flowers of a small leguminous shrub.

Hab. Natal (Inchanga).

ARRUGIA, *Wallengr.*

Arrugia brachycera, n. s.

Allied to *A. basuta*, Wallengr., and *A. Protumnus*, Linn.

Exp. al. (♂), 1 in. 4—6 lin.; (♀), 1 in. 7—9 lin.

♂. Dull fuscous-grey, with a slight ochraceous tinge; in both wings a blackish terminal disco-cellular spot and discal row of spots (indistinct in hind wing). Fore wing: Hind-marginal area beyond discal spots darker than basal area; between disco-cellular spot and discal spots a dull suffused space of pale grey tinged with ochraceous, radiating on the basal portion of the median nervules; first four spots of discal row confluent and forming a costal bar as far as 3rd median nervule—the other four small, indistinct, separate, in a row inclining inwardly, between 3rd median nervule and submedian nervure. Cilia dull white, with rather narrow fuscous interruptions at extremities of nervules. Under side: Hind wing and apex of fore wing dull hoary grey. Fore wing: Basal area whitish grey, scarcely separable from discal suffused space, which is dingy whitish and much more extensive than on upper side, forming a band beyond discal row of spots; this row and disco-cellular are very distinctly defined on the pale ground; near base two less distinct small fuscous spots, one in cell the other below it; outwardly edging discal dingy-whitish band a row of rather ill-defined sagittate fuscous marks; hind-marginal border pale brownish from a little below apex. Hind wing: Irregularly reniform disco-cellular spot, and almost regular discal row of spots, very pale brownish, with a thin dark brown edging line (stronger on inner edge of row) relieved externally by a thin white line; in basal area the traces of two highly-irregular transverse rows of broken pale-brownish spots; a submarginal row of minute, almost obsolete, subsagittiform spots; hind-marginal border clouded with pale brownish.

♀. Rather paler and slightly more ochraceous. Fore wing: Discal pale space less obscure, not radiating on median nervules, but extending more or less distinctly beyond discal row of spots. Hind wing: Spots not quite so indistinct. Under side: Hind wing and apex of fore wing less hoary, more brownish grey. Hind wing: Spots of basal area, except first and last of outer row, altogether obsolete; sagittiform spots of submarginal row much larger and more distinct.

The absence of yellow-ochreous colouring at once distinguishes this very dingy *Arrugia* from *A. Protumnus* Linn., and makes it more like *A. basuta*, Wallengr., which is the type of the genus.

From the latter, as far as the male is concerned, *A. brachycera* may be known by (1) its darker colouring, (2) larger and more pronounced spots, and (3) want of whitish on disc; while on the under side (4) it is considerably darker, (5) has the fore-wing spots much larger (with the marked exception of the spot near base below cell), and (6) the discal row of hind wing much broader and more regular. The female is readily recognised by (7) wanting the conspicuous white discal markings of the female *A. basuta* on the upper side. Apart from pattern and colouring, the remarkable shortness of the antennæ is very noticeable, especially in the female, where they are only about 2½ lines in length,—shorter than in *Protumnus*, and much shorter than in *A. basuta*.

This *Arrugia*, which I formerly regarded as a local race of *Protumnus* (see Rhop. Afr. Aust., ii., p. 279, *obs.*), is rare in collections. I found it in some abundance at Kuysna, on the south coast of the Cape Colony; and a few examples of what I consider a small dark variety of it have been taken at Cape Town. It appears in the height of summer, and delights to sit on the ground in the hottest and dustiest places.

Hab. Cape Colony (Western Districts).

D'Urbania, *Trim.*

D'Urbania saga, n. s.

Allied to *D. amakosa*, Trim.

Exp. al. 1 in. 1 lin.

♂. Dark brown; a discal row of dull pale ochreous-yellow spots in each wing. Fore wing: Discal row of

five spots strongly incurved, so that the last spot is rather nearer base than the first one; a faint trace of a sixth spot just below 1st median nervule; a row of three small and very indistinct spots of the same colour a little beyond and parallel with upper part of discal row; at extremity of discoidal cell a scarcely visible ochreous-yellow spot, preceded by a similar not quite so indistinct spot in cell. Hind wing: Discal row of five spots less distinct than in fore wing, not curved, but rather irregular; the 1st and 2nd spots sublinear and confluent, the last minute (below 1st median nervule). Cilia of both wings dark brown, interrupted with white between nervules. Under side: Dark brown, variegated with whitish. Fore wing: 1st spot of discal row small, white, the remainder larger than on upper side and of a paler yellow; in discoidal cell a longitudinal whitish streak from base and a terminal whitish spot; between extremity of cell and discal spots a transverse row of three short whitish rays; spots beyond discal row distinct, white; three or four small white marks between nervules on costal edge beyond middle. Hind wing: A conspicuous, irregular, white, discal stripe, well defined internally but not externally, and very sharply angulated on radial nervure; before discal stripe the following whitish marks, *viz.*, one on costa at base, one in discoidal cell at base, and another just before extremity of cell; and an interrupted transverse row of very indistinct spots before middle; between discal stripe and hind margin a row of thin internervular lunules.

From *D. amakosa*, Trim., this species is at once distinguished by (1) the conspicuous sharply-angulated white stripe on the under side of the hind wing. Other differences are (2) the want of whitish irroration generally on the under side; and on the upper side, (3) the more sharply incurved discal row of spots in the fore wing, and (4) the not incurved and more irregular row in the hind wing. A distinction is also perceptible in the form of the wings, as (5) they—especially the fore wings—have a much less curved costa and more produced apical region.

Only a single specimen of this interesting *D'Urbania* has come under my notice. It was taken by Mr. L. Péringuey, of Cape Town, in January, 1882, on the Ilex River Mountain, in the Worcester district of the

Cape Colony. Mr. Péringuey informs me that this individual was in company with another larger butterfly, which he thinks was most probably the female, but which he did not succeed in capturing.

Hab. Cape Colony (Western Districts).

PAPILIONIDÆ.

PIERINÆ.

PIERIS, *Schr.*

Pieris Ogygia, n. s.

Allied to *P. Zochalia*, Boisd., and *P. Calypso*, Dru.

Exp. al. (♂), 2 in. 1 lin.; (♀), 2 in. 6½ lin.

♂. White, with black markings. Fore wing: Costa edged very narrowly with black; base with a slight pearly gloss; at extremity of discoidal cell an oblique, angulated, transverse streak, wider in its lower portion; a rather narrow apical and hind-marginal border (widest at apex), rather sharply indenting the white on nervules, ending abruptly on 1st median nervule; at extremity of submedian nervure a small spot, quite separate from hind-marginal border; immediately before border four rather small spots, of which three form an oblique row from costa (the 1st touching apical border), and the 4th is between 2nd and 3rd median nervules and rather indistinct. Hind wing: On hind margin six nervular spots, all (except that at end of submedian nervure, which is small and almost linear), large, subovate, well separated. Under side: Hind wing and apex of fore wing pale chrome-yellow; nervures of hind wing universally black. Fore wing: In upper part of cell, for a little distance from base, a flush of orange; discocellular terminal streak fainter than on upper side, commencing a little further from costa; four submarginal spots distinct; apical yellow extending narrowly to about middle of hind margin; a hind-marginal row of seven small, inwardly-acuminate, nervular, black spots. Hind wing: Costa, from base to before middle, edged with orange-red; a submarginal row of seven small, subsagittate, black, internervular spots, of which the middle or 4th one is very small; hind-marginal spots all smaller than on upper side (except that at end of submedian nervure, which is larger), narrow, subrhomboidal, well separated; a faint blackish dot on each

side of 1st median nervule near its origin; on fold between median and submedian nervures, for a little distance from base, a very faint orange streak.

♀. Similar to male, but considerably larger. Hind wing: A submarginal row of five small blackish spots, corresponding to the subsagittate spots of the under side, but wanting the first and last spots. Under side.—Fore wing: Flush of orange at base wider. Hind wing: A black line marks middle part of fold between median and submedian nervures.

Partaking of the characters of both *P. Calypso*, Drury, and *P. Zochalia*, Boisd., this butterfly is on the whole nearer to the latter, especially as regards the female. It is distinguished from *Zochalia* by having in the fore wing (1) a narrower, more angulated, disco-cellular streak, and (2) a much narrower apical and hind-marginal border, enclosing no white spots; and in the hind wing (3) much rounder hind-marginal spots, not acuminate inwardly or united by the festooned line often found in *Zochalia*. On the under side (4) the yellow ground is much brighter; (5) the fore wing has a basal flush of orange, and (6) only four separated submarginal spots instead of a continuous band; while in the hind wing (7) the nervures are much more narrowly black, and (8) the cellular striæ and festooned submarginal line are wanting.

From *Calypso* this species is readily separated by its smaller size and much narrower black border of the fore wing; as well as, on the under side, by its black nervures and very much smaller submarginal black spots of the hind wing, and the want in the same wing of the large terminal disco-cellular spot. The female has no resemblance to that of *Calypso*, which has a broad dusky border and ground suffused with yellow and grey; much like those presented by the darker females of *Gidica*, Boisd.

I have only seen one example of each sex. The male was sent to me by Mr. Walter Morant in 1869, that gentleman writing that he believed it was captured near Pinetown, Natal, where he was resident at the time.

The female was taken at D'Urban, in the same Colony, by the late M. J. McKen in the year 1866.

Hab. Natal (Coast Districts).

TERACOLUS, *Swains.*

Teracolus Bowkeri, n. s.

Allied to *T. Agoye*, Wallengr.

Exp. al. 1 in. 6—7½ lin.

♂. White, with yellow-ochreous apical patch in fore wing. Fore wing: Base and costa sparsely irrorated with black; apical patch internally irregularly bordered with black, which is broad in its middle part (and sometimes also in its upper part), but attenuated and usually ill-defined towards its extremities; a narrow ray of clear yellow ochreous immediately beyond the black, but the rest of apical patch tinged with greyish. Hind wing: Base irrorated with black, more widely and rather more closely than in fore wing; a longitudinal ray of black irroration on costa beyond middle, its outer extremity sometimes strongly marked; subcostal nervules very rarely thinly defined with black; in some specimens a few black atoms scattered about disc. Under side: Hind wing and apical area of fore wing very faintly tinged with yellowish. Hind wing: Costa very narrowly edged with chrome-yellow from base to a little beyond middle; a general very fine and very sparse irroration of dusky atoms.

♀. Fore wing: Apical patch fuscous-brownish, darker inwardly, traversed mesially by a dull yellow-ochreous ray, which is sometimes suffused and ill-defined; base more widely irrorated than in male. Hind wing: beyond middle, from costa, a transverse row of three ill-defined dull-fuscous spots, the first of which represents the termination of the black costal irroration in the male. Under side: Yellowish colouring much more decided than in male. Hind wing: Fine dusky irroration closer than in male.

This little species is to be distinguished from *T. Agoye*, Wallengr., as far as the male is concerned, by (1) the larger, paler, less warmly-tinted apical patch of fore wing; (2) total or almost total absence of black nervules in both wings; (3) want of copious black irroration in fore wing; and (4) presence of strongly-marked irroration ray on costa of hind wing; while (5) the under side is somewhat more yellowish. The female has (6) a much larger apical patch, owing to the breadth and extension inferiorly of the fuscous-brown on its inner border; but

(7) wants the disco-cellular terminal spot presented by *Agoye* female in both wings; (8) the under side is duller in tint, and wants both the disco-cellular spots and the tinge of pale yellow at the base of the fore wing.

Colonel Bowker, after whom I have named this butterfly, took a solitary male of it in Basuto-land; and in 1871 sent me a second example of the same sex from Hope Town, on the Orange River. Later in that year he forwarded a male and four females from the Vaal River. On the 6th September, 1872, I captured a male at Kolberg, in Griqualand West. The only other specimen I have seen was a male, received in 1879, taken by Mrs. Barber on the Vaal River.

Hab. Cape Colony (Northern and North-Eastern Districts).

HESPERIDÆ.

PYRGUS, *Hübn.*

Pyrgus Tucusa, n. s.

Allied to *P. Mohozutza*, Wallengr., and *P. Chaca*, Trim.

Exp. al. 1 in.—1 in. 3 lin.

♂. Fuscous, with semi-transparent white spots. Fore wing: From base to before middle, along costa, median nervure, and inner margin, some yellowish white irroration; at extremity of discoidal cell two elongate spots one above the other; a discal continuous row of nine spots, strongly curved outwardly in its upper portion, but thence sharply deflected inwardly to submedian nervure a little beyond middle; of this row the 7th is the largest spot, and the 8th the smallest; close to upper part of hind margin a row of fine, almost obsolete, dull fulvous-ochreous spots. Hind wing: Median and submedian nervures clothed with dull yellowish white scales and hairs; at extremity of cell an ill-defined whitish spot. Cilia white, with narrow fuscous nervular interruptions,—those in hind wing almost obsolete. Under side: Dull creamy white, varied with very pale fulvous, and with small black spots. Fore wing: White spots as on upper side, and edged with fuscous; inner-marginal area pale fuscous; hind-marginal border creamy, faintly tinged with fulvous, becoming macular towards posterior angle; along hind-marginal edge a row of small internervular black spots. Hind wing: A thin costal edging

near base, discoidal cell and a small space beyond, and a widish hind-marginal border, very pale fulvous; five small black spots near base, of which two are in cell; two parallel discal rows of small black spots, seven in each row; inner-marginal fold tinged with fuscous at its broad anal-angular extremity; hind margin thinly edged with fuscous, interrupted (like the fulvous border) by nervules of the ground colour.

♀. Fore wing: White spots inclining to creamy, all smaller than in male (especially the 7th, while the 8th is wanting or exceedingly minute); hind-marginal spots distinct, pale fulvous-ochreous, seven in number. Hind wing: Disco-cellular spot large, pale fulvous-ochreous; close to hind margin a row of seven spots of the same colour, not extending below submedian nervure. Cilia creamy white, with wider fuscous interruptions (in hind wing only at extremities of median nervules). Under side: As in male, but the fulvous markings much brighter. Hind wing: Two additional fulvous marks immediately before inner discal row of black spots, *viz.*, one between costal and subcostal, the other between median and submedian, nervures.

In size this *Pyrgus* is nearer to *P. Mohozutza*, Wallengr., but in pattern to *P. Chaca*, Trim. From the former both sexes constantly differ in (1) the continuous character of the discal row of white spots, due to the presence of two spots between the costal three and those below median nervure. The male is further separable by (2) the purer white of the discal spots and the cilia, and (3) by the obsolete condition of the hind-marginal ochreous spots. On the under side both sexes present in the hind wing (4) a regular inner discal row of seven black spots instead of the three or four widely-separated and irregularly-placed spots in *Mohozutza*; (5) paler (and on costa and submedian nervure much reduced) fulvous markings; and (6) a whitish instead of fuscous inner-marginal fold. Apart from its very much smaller size, *Tucusa*, in both sexes, is very like *Chaca* on the upper side; but on the under side it wants entirely the broad transverse median fulvous band and fulvous base, separated by a creamy black-edged band, so conspicuous in *Chaca*.

Mr. H. Barber first sent me examples of this species, which he took in the Transvaal country in 1873. Several

others were given to me by Mr. J. M. Hutchinson in 1881, with the information that he had taken them near Estronet, in Natal.

Hab. Natal (Upper Districts), and Transvaal.

THYMELICUS, *Hübn.*

Thymelicus Wallengrenii, n. s.

Closely allied to *T. niveostriga*, Trim.

Exp. al. 1 in. 2—4 lin.

♂. Dull brown; the hind wing much darker, almost fuscous; fore wing with almost transparent disco-cellular terminal spot and six discal spots. Fore wing: Spot at extremity of cell divided by disco-cellular fold; first three spots of discal row minute but distinct, forming a thin outward-curving costal ray about midway between disco-cellular spot and apex; other spots of discal row larger, forming a strongly inward-curving row between third median nervule and submedian nervure—the middle spot of these three being the largest, subquadrate, and immediately below disco-cellular spot. Hind wing: Spotless. Cilia broad, dusky whitish. Under side: Hind wing and costa and apical area of fore wing pale ochreous-brown, with a reddish tinge. Fore wing: Spots as on upper side, except that those in costal part of discal row are usually less distinct and sometimes obsolete; a hind-marginal whitish cloud over lower part of ochreous-brown of apical area. Hind wing: A very conspicuous, rather broad, white longitudinal stripe, commencing at a little distance from base and running along disco-cellular fold to hind margin; a duller, much less conspicuous, wider whitish stripe along inner-marginal edge; space of inner-marginal fold brownish grey.

♀. Paler, duller; hind wing not darker than fore wing; spots of fore wing rather larger, the three lower ones of discal row more widely separated from each other. Under side.—Hind wing: Grey of inner-marginal fold paler; inner-marginal white stripe very narrow and ill-defined; on disc the minute traces of a row of whitish spots.

From *T. niveostriga*, Trim., this species may at once be recognised by (1) the conspicuous longitudinal central white stripe on the under side of the hind wing. Other

distinctions are (2) three spots instead of two in costal part of discal row; and on under side (3) the nervures not paler than the ground colour; (4) the whitish cloud on hind margin of fore wing; and (5) the dull and ill-developed state of the inner-marginal white stripe of the hind wing, which in *niveostriga* is shining pure white.

It gives me much pleasure to name this new butterfly in honour of Pastor H. D. J. Wallengren, the distinguished Swedish lepidopterist, whose good fortune it was to be the first to make known to Science a large number of the South-African Rhopalocera.

Like so many other novelties among the *Hesperidæ*, this curious *Thymelicus* rewarded the unremitting researches of Colonel Bowker, who discovered it in Zulu-land in 1880. Later in the same year he sent an individual taken at the Biggarsberg in Natal.

Hab. Natal (Upper Districts), and Zulu-land.

NISONIADES, *Hübn.*

Nisoniades phyllophila, n. s.

Nearly allied to *N. Nottoana*, Wallengr.

Exp. al. 1 in. 5—7 lin.

♀. Pale reddish brown, with fuscous and transparent spots. Fore wing: A central band of seven fuscous-edged transparent spots, disposed thus, *viz.*, an outwardly oblique row of three between costa and median nervure (of which the 2nd and 3rd—larger than the 1st—are in discoidal cell), and an inwardly oblique row of four between 3rd median nervule and submedian nervure (of which all are small but that between 2nd and 1st median nervules, which is quadrate and much the largest in the entire row of seven); near apex a short outwardly oblique costal row of four small transparent spots, of which the first and last are minute; between the extremity of this subapical row and the 4th spot of the median row, two fuscous spots, sometimes enlarged and elongated longitudinally; before middle, between median and submedian nervures, a rather indistinct fuscous spot. Hind wing: A transverse row of three widely-separated fuscous spots before middle, one of which (at extremity of discoidal cell) is more indistinct than the others; beyond middle a strongly-curved transverse row of seven fuscous spots, of which the first next

costa is much the largest, and the 2nd and 3rd are larger than the remainder; along hind margin, except near apex, a narrow irroration of whitish scales, more developed towards anal angle. Cilia in fore wing reddish brown, except in concavity just above posterior angle, where it is white; in hind wing white, except towards apex, where it is brown. Under side: Markings mostly as on upper side; brown of fore wing paler; hind wing white, broadly bordered with brown costally and apically. Fore wing: Fuscous spot before middle faint, but marked with two subvitreous dots; two fuscous spots beyond middle obsolete or very faint. Hind wing: Costal brown narrow at and close to base, but very broad beyond middle and in apical area; lowest spot of transverse row before middle (and often also 5th spot of row beyond middle) obsolete.

This form is very near the female of *N. Nottoana*, Wallengr., but easily to be distinguished by (1) the conspicuous white field of the under side of the hind wing, and (2) the whitish irroration of the hind margin of the same wing on the upper side. Both these characters approximate the insect to *N. Flesus*, Fab., but it differs widely from the latter in its much smaller size, as well as in the number, shape, and relative size of both the transparent and fuscous spots. The nine specimens before me all appear to be females, but four of them are too much injured for any determination of their sex.

For many years I had but a single specimen of this butterfly, and regarded it as a possible sport of the female *Nottoana*. Another was sent, after a long interval, from D'Urban, Natal, by the late Mr. McKen; but Colonel Bowker has on different dates during the last four years forwarded from the same locality as many as seven examples. The Hewitson Collection in the British Museum contains six specimens, recorded as received from Delagoa Bay.

Hab. Natal (Coast Districts), and Delagoa Bay.

XVI. *Descriptions of sixteen new species of parasitic* Cynipidæ, *chiefly from Scotland.* By P. Cameron.

[Read July 4th, 1883.]

Allotria ruficollis, n. s.

Black; antennæ and legs yellow; head, prothorax, breast, metapleura wholly, mesopleura at the sides, and base of abdomen, red; tegulæ piceous. Wings hyaline; nervures dull yellowish. The antennæ are longer than the body; 3rd joint straight and little longer than the 4th; the last a little longer than the preceding; the apical joints are somewhat fuscous. Base of abdomen pilose. Radial cellule one-half longer than broad, closed. Length, 1½ mm. Male.

In coloration this species comes very close to *A. pleuralis*, Cam., but that has not the mesopleura black, the antennæ are only yellow at the base, the radial cellule is not much longer than broad, and it is also a smaller species.

Hab. Mull, in June.

Allotria ruficeps, n. s.

Black; pronotum, mesopleura on lower side, and breast, piceous-red; legs reddish yellow; joints 1—4 of the antennæ yellow, the rest piceous; head and petiole red. Wings hyaline; nervures fuscous. The antennæ are longer than the body; 3rd joint straight, distinctly one-fourth longer than the following; the last is not much longer than the preceding. The radial cellule is closed and not much longer than broad; the cubital nervure is traced for two-thirds of the extent of the wing. The pubescence on metathorax and base of abdomen is dense. Length, 1½ mm. Female.

The radial cellule is shorter than in *A. flavicornis*, and the shortness of this cellule easily distinguishes it from *A. ruficollis*, with which it has some resemblance in

coloration. It is a larger insect than *A. pleuralis*, the antennæ are somewhat longer, and have the 3rd joint longer in proportion to the 4th, and the cubital nervure is not traced in *pleuralis* at all.

Hab. New Galloway, in June.

Allotria curvicornis, n. s.

Black; the four or five basal joints of antennæ fuscous; mouth piceous; legs dull testaceous; the coxæ and femora almost piceous at the base. Wings hyaline; nervures fuscous. The antennæ are longer than the body, being as long as the fore wings; the 3rd joint is slightly and the 4th and 5th distinctly curved and slightly thickened; the 6th is very slightly bent, but not so much as the 3rd. The radial cellule is of moderate size, longer than broad; its outer margin is curved; the cubital nervure is only traced at the base. The pubescence on the metathorax is distinct; the petiole piceous. Length, $1\frac{3}{4}$ mm.

Allied to *A. longicornis*, but differing from it in its shorter radial cellule, somewhat shorter antennæ, these in *longicornis* not having the 4th and 5th joints curved.

Hab. Glen Lyon, in July.

Allotria Mullensis, n. s.

Black; head dull ferruginous, vertex piceous; pleura almost piceous; five basal joints of antennæ pale testaceous, the rest fuscous; legs dull testaceous; coxæ and femora fuscous. Two basal joints of antennæ enlarged, as long as the 3rd, which is longer than the 4th; joints 3—5 thin; the rest much thicker, becoming thicker towards the apex; last joint one-half longer than the preceding. Metathorax and coxæ covered with a dense white pubescence. Wings hyaline, the base yellowish; nervures pallid-yellow; radial cellule closed, minute, almost semicircular, not being much longer than broad; nervures thick; cubital nervure shorter than the length of radial cellule; fringe on apex of wing longish. Male. Length, $\frac{3}{4}$ mm.

Comes nearest to *A. brevis*, Thoms., but is readily known from it and every species known to me by the shortness of the radial cellule, which differs also in being

semicircular, not triangular, as is usual; the reddish head and piceous pleuræ also distinguish it from *A. brevis*.

Hab. Mull, in June.

Allotria salicis, n. s.

Black; face, pleura, and base of abdomen piceous; antennæ fuscous, the base testaceous; legs testaceous; the four posterior coxæ, the base of four anterior femora and the greater part of posterior, light fuscous. Wings hyaline; radial cellule closed, double as long as broad; nervures pale yellow. Antennæ a little longer than the body; 2nd joint thick, oval, a little more than one-half the length of 3rd; 4th a little longer than 2nd; the joints become gradually and slightly thicker towards the apex. The scutellum, metathorax, and base of abdomen are covered with a longish white pubescence; the rest of thorax and head sparsely pilose. Female. Length, 1—1½ mm.

From *A. minuta* this species may be known by its darker antennæ and legs, longer radial cellule; the latter is a little shorter than it is in *longicornis*, and *salicis* differs also from that species in its lighter-coloured legs, much shorter antennæ, and piceous thorax, it being also a smaller species. In *salicis* there are two indistinct sutures on the mesonotum, which, however, only extend from the scutellum to the middle, and there is an indistinct longitudinal suture on the lower side of mesopleura. It seems to belong to Foerster's genus *Hemicrisis*.

Bred from a black *Aphis* on *Salix pentandra* from the Kilpatrick Hills.

Allotria piceomaculata, n. s.

Head and thorax piceous; abdomen black; pleuræ dark ferruginous; antennæ black, base testaceous; legs yellow. The antennæ are longer than the body, not much thickened towards the apex; 3rd joint nearly double the length of 4th. Wings hyaline; nervures fuscous; radial cellule open, double as long as broad; cubital nervure extending beyond the middle. Length, 1 mm.

Readily known by the piceous head and thorax and long antennæ, which are longer than in the other species with open radial cellule.

Hab. Dumfries, in June.

Psichacra glottiana, n. s.

Black, shining; apex of coxæ, trochanters, base of femora and their apical half, tibiæ and tarsi, reddish. Wings hyaline; nervures testaceous. The antennæ are longer than the body; the 3rd and 4th much thinner than the other joints; 5th thicker; the rest of nearly equal thickness; 3rd joint distinctly longer than 4th; 5th shorter than latter; 6th nearly of the same size as 5th; the others to the 13th shorter, oblong, and covered sparsely with microscopic bristle-like hairs; the basal joints of the flagellum are somewhat piceous. Scutellar cup oval, rather shallow, a round fovea at its apex; foveæ at base of scutellum moderately large and deep. Below the cup the scutellum is smooth and shining; lower down coarsely punctured. The hair on metanotum moderate in length, dull silvery white; hair-fringe on base of abdomen grey. Abdomen slightly aciculated on basal half; apical smooth, shining. Radial cellule closed, a little longer than broad; margin deeply fringed; cubital nervure extending beyond the middle. The legs are pilose. Length, nearly $3\frac{1}{2}$ mm.

Hab. Cambusland, on banks of Clyde.

Psichacra similis, n. s.

Black, shining; antennæ (except at base and apex) and legs (except base of coxæ) red. Wings clear hyaline; nervures testaceous. Antennæ of the length of the body, without a distinct club; 3rd and 4th joints about equal; 5th a little shorter; 6th scarcely tapering at base and apex, the following distinctly so; 9th to 12th oval. Scutellar cup moderately deep, oval; sides coarsely punctured all round; foveæ at base of scutellum moderate; the outer margin striated. The hair on metanotum is scattered and sparse. The male has the antennæ nearly three-quarter times longer than the body; the 3rd joint is, if anything, shorter than 4th. In colour there is no difference between the two sexes, and the wings are as in the other species. Length, 4—5 mm.

Allied to *P. longicornis*, Htg. (*gracilis*, Dbm. sec. Thoms.), but that is a slightly larger species. The tegulæ with it are red; the foveæ at base of scutellum are larger, deeper, and the outer margin is red or piceous, and is not striated as in *similis*. The hair on the metanotum is much thicker and denser, the antennæ are shorter, the joints thicker, especially at base of flagellum, and the antennæ are entirely red, as are also the legs. As with most of the species, the base of abdomen is sometimes red.

Hab. Cambusland, along the banks of the Clyde, July.

Psichacra Marshalli, n. s.

Black; antennæ fuscous-black; legs reddish testaceous; coxæ for the most part black; tegulæ testaceous. Antennæ much longer than the body (nearly double), filiform; 3rd joint thickened, slightly curved, longer than 4th. Head and thorax opaque, alutaceous. Scutellar cup small, narrow, longer than broad, acutely pointed at base. Foveæ at base of scutellum large; their outer border piceous, and ending in an acute tooth. Metanotum densely hairy. Wings hyaline, but with a slight fuscous tinge; nervures testaceous. Length, 3 mm.

The opaque alutaceous head and thorax, small narrow cup of scutellum, and thickened curved 3rd joint of antennæ, easily enable this species to be separated from *longicornis* and *similis*.

Hab. Barnstaple (*Rev. T. A. Marshall*).

Trybliographa nigricornis, n. s.

Black; extreme apex of coxæ and trochanters, knees broadly, tibiæ and tarsi, testaceous; the latter two infuscated towards the apex. Antennæ not much shorter than the abdomen and thorax together; 3rd and 4th joints equal in length; 5th a very little shorter; 6th to 12th moniliform, longer than broad, striated, thicker than the basal joints; last joint not much thinner, but longer than penultimate. The thorax is covered with a scattered pale pubescence; the scutellum rugose, its cup almost oval; sides of metathorax covered with long griseous hair. Abdomen a little longer than the head and thorax together, somewhat compressed; the hair-

fringe dense, griseous. Wings hyaline, slightly yellowish at the base; cubital nervure continued to the end of wing; tegulæ dull black. The legs are covered with longish stiff-looking, closely-set, hair of a white glistening colour. The male has the antennæ nearly one-half longer than the body; the 3rd joint is a little shorter and thinner than the 4th, which is swollen, and is shorter than the 5th. Length, 4 mm.

This species comes nearest to *Eucoila albipennis*, Thoms. (which is in all probability identical with *diaphanus*, Htg., and *nigripes*, Gir.), but is sufficiently distinguished from it by its longer and entirely black antennæ and complete cubital nervure.

Hab. Clydesdale; Dalry, Ayrshire.

Trybliographa testaceipes, n. s.

Black; apex of coxæ, trochanters, femora (except in the middle at the sides), tibiæ and tarsi, testaceous; flagellum piceous-red. Antennæ as long as the thorax and abdomen; 3rd joint a little shorter than the 4th; 5th longer than either the 4th or 6th; 6th to 12th moniliform, longer than broad, of nearly equal length; 13th longer and thicker than 12th. Thorax almost glabrous; scutellum obscurely rugose, punctured; the cup oval. Sides of metathorax aciculated, almost glabrous. Abdomen a little longer than the head and thorax together, slightly compressed, the hair-fringe weak, dull white. Wings clear hyaline; nervures yellow; cubital nervure obsolete. Length, scarcely 2 mm.

In coloration this species agrees best with *T. scutellaris*, Htg. sec. Gir., but that is a larger and stouter species, and has the 3rd joint of the antennæ longer than the 4th, and the cubital nervure complete. It comes near to *diaphanus*, Htg. = *albipennis*, Thoms., but the latter is a longer species; the antennæ are shorter, and with the 5th joint of the length of the 3rd and 4th; the legs are much darker, the femora being almost entirely black, and sometimes more or less of the tibiæ.

Hab. Cambusland; Dalry.

Erisphagia longipes, n. s.

Black; legs with coxæ piceous-red, the femora suffused with fuscous. Wings scarcely hyaline; nervures fuscous. The antennæ are filiform, much longer than the body; all the joints of nearly the same length. Radial cellule longer than broad, the nervures curved; cubital nervure extending to near the apex of the wings. Abdomen shorter than the thorax, a little compressed, the base piceous. Pleuræ faintly aciculated, the sides of metathorax sparsely pilose; the rest of the body glabrous. Wings with long cilia. Legs long. Male. Length, $1\frac{1}{4}$ mm.

Only two species have been referred to this genus, namely, *E. depilis*, Gir., and *E. curta*, Gir., and from these the present species is easily recognised by its totally piceous-red legs, the others having them reddish only at the knees, as in *depilis*, or the knees and anterior tibiæ, as in *curta*.

Hab. Alsasua, Spain (*Dr. David Sharp*).

Melanips femoralis, n. s.

Black; the greater part of anterior femora, the apical fourth of middle, and the apex of posterior tibiæ and tarsi, fulvous-testaceous; the apex of posterior tibiæ and tarsi more or less fuscous. Antennæ nearly as long as the body, becoming very slightly thickened towards the apex; 3rd joint nearly one-fourth longer than the next, the other joints becoming gradually shorter to the penultimate, which is not half the length of the last. Sutures on mesonotum narrow, becoming obsolete towards the base of mesonotum; the puncturing on scutellum is not much stronger than on mesonotum, except at sides, which are rugose; mesopleura for the greater part smooth and shining; coxæ opaque, finely punctured, except behind, where they are smooth and shining. Abdomen not much longer than thorax, smooth, shining, semisessile, the base aciculated, the hair on it sparse; nervures as in *opacus*. Length, 4 mm.

From *M. opacus* the present species may be known by its darker-coloured femora and lighter-coloured tibiæ and tarsi, by the smaller size of the foveæ at base of scutellum, less strongly punctured scutellum, less

clearly impressed sutures on mesonotum, and less hairy thorax. *M. longitarsis* is readily distinguished from it by the 3rd and 4th joints of the antennæ being equal in length.

Hab. Bonar Bridge, Sutherlandshire, in June.

Aegilips scotica, n. s.

Black; covered with a longish scattered pale down. Antennæ reddish brown beneath from the middle of 1st joint. Mouth and palpi brown; tegulæ testaceous; coxæ black, except at extreme apex; trochanters and posterior femora for the most part, and the anterior to a less extent, fuscous-black; the rest of legs dull testaceous obscured with fuscous. Wings hyaline; nervures fuscous. Mesonotum almost shining, very slightly and closely punctured; furrows deep; there is a transverse furrow at base of scutellum; in front of this and between the two lateral furrows is a shallow pit, which is wider than long. Scutellum rugose, terminating in a short, blunt, thick spine, which is obliquely truncated at the top. Metathorax rugose, reticulated; in centre of metanotum are two smooth fields, the upper being the largest. Collar striated in front. Below the tegulæ on mesopleura is a triangular striated part bounded by a ridge. Petiole rugose, shorter than broad. Abdomen shorter than thorax, smooth, shining. Antennæ as long as the body; 3rd and 4th joints equal. Male. Length, nearly 4 mm.

This species has the greatest resemblance to *A. subulifera*, Thoms., but that species has the mesonotum semiopaque, transversely striated, and the petiole much longer than broad.

Hab. Glen Moriston, in June.

Aegilips ruficornis, n. s.

Black; antennæ (except at base and apex), and legs red; coxæ black, except at apex; posterior tarsi and apex of tibiæ fuscous. Antennæ if anything longer than the body, becoming thickened towards the apex; 3rd and 4th joints subequal; 5th shorter; last joint one-half longer than preceding. Mesonotum smooth, shining; sutures distinct, but shallow; transverse

suture in front of scutellum much deeper and narrower. Scutellum smooth in front; the sides have some irregular and indistinct reticulations; behind it is rugose, but not strongly above; below reticulated, the two parts being separated by a keel; the foveæ in front are distinct, smooth; behind there is a wide shallow fovea at each side. Metathorax rugose, reticulated indistinctly in the middle of metanotum. Petiole coarsely striated, broader than long. Abdomen smooth, shining, shorter than abdomen. The body is covered with a longish fuscous pubescence. On the coxæ the hair is white. Wings hyaline; nervures testaceous. Pronotum and episternum obscurely punctured. Length, 4 mm.

The smooth scutellum allies this species to *A. nitidula*, Dlm., but it is a stouter insect; the antennæ are longer, the sutures on mesonotum are scarcely crenulated, the foveæ at base of scutellum are distinct, and the antennæ and legs are red, not yellow, as in *nitidula*. The smooth scutellum separates it from *Dalmani* and *curvipes*.

Hab. Bishopton.

Aegilips striolata, n. s.

Black; antennæ reddish testaceous, more or less fuscous above, especially towards the apex; legs testaceous; apex of femora and tibiæ yellow; posterior tarsi and apex of tibiæ fuscous. Antennæ longer than the body; 3rd joint distinctly longer than the 4th; 4th and 5th subequal; last joint not much longer than preceding. Mesonotum scarcely shining; sutures distinct, crenulated; in front of scutellum transversely striated; a large shallow fovea longer than broad in front of transverse suture at scutellum. Pronotum and mesopleura above finely punctured, opaque. Scutellum rugose, smooth and shining at the base; looked at from the side it is bluntly triangular, above bluntly conical; foveæ obsolete. Metathorax rugose, reticulated; bounding the centre of the metanotum are two keels, which widen out in the centre; between these is a straight keel. Petiole a little longer than broad, rugose. Abdomen smooth and shining. Wings hyaline; nervures yellowish; tegulæ testaceous. Length, 3½ mm.

In general appearance this distinct species most nearly resembles *A. nitidula*, but the striated mesonotum,

punctured pronotum and scutellum, sufficiently separate it from the common species; in having the pronotum punctured it agrees with *A. puncticollis*, Reinh. (which I regard as only a variety of *Dalmani*), but the striated mesonotum, the large foveæ at apex of mesonotum, the less strongly punctured scutellum, the almost obsolete scutellar foveæ, mark it out as a very different species. *A. subulifera*, which has the mesonotum transversely striated, differs in the scutellum ending in a blunt spine.

Hab. Mugdock, near Glasgow.

The following table will, I believe, enable our species of *Aegilips* to be identified. *A. Dalmani*, I may add, is the most variable species; the legs vary from ferruginous to piceous, and the posterior femora, tibiæ, and tarsi may be for the most part black or fuscous; the antennæ may be entirely black, or brownish, or reddish on the under side; while the collar and the apex of mesonotum are sometimes aciculated, or even punctured. It is often found on windows.

Synopsis of the British Species of *Aegilips*:—

1 (8). Scutellum conical, not ending in a spine.
2 (5). Scutellum smooth, impunctate in front and at the sides.
3 (4). Scutellar foveæ obsolete; legs and antennæ bright yellow .. .. *nitidula*, Dlm.
4 (3). Scutellar foveæ distinct; legs and antennæ red .. .. *ruficornis*, Cam.
5 (2). Scutellum rugose.
6 (7). Mesonotum transversely striated, a large fovea at its apex; scutellar foveæ almost obsolete; legs testaceous and yellow .. .. .. *striolata*, Cam.
7 (6). Mesonotum not transversely striated; scutellar foveæ distinct; legs ferruginous .. .. *Dalmani*, Reinh.
8 (1). Scutellum ending in a spine.
9 (10). Mesonotum semiopaque, transversely striated; petiole much longer than broad (in male); foveæ at base of scutellum obsolete *subulifera*, Thoms.
10 (9). Mesonotum not striated; scutellar foveæ large.
11 (12). Spine short, obliquely truncated at apex, not one-fourth of length of scutellum; legs fuscous; petiole shorter than broad .. *scotica*, Cam.
12 (11). Spine long, curved, more than one-third of length of scutellum; legs and antennæ red; petiole a little longer than broad .. .. *armata*, Gir.

XVII. *Further notice concerning the fig-insects of Ceylon.*

By J. O. Westwood, M.A., F.L.S., &c.

[Read July 4th, 1883.]

Plate XVI.

A renewed examination of some of the numerous species of fig-insects, received from Mr. Stainforth Green and Dr. Thwaites, has brought to light some curious and unexpected circumstances relative to the sexes of several of these little creatures which it is necessary for me to bring before the notice of our Society, especially as it enables me to correct an error into which I have inadvertently fallen from too great confidence in the analogy which might be thought to exist between several of these creatures, by which we might predict as to the relative sexes and their consequent specific sexual identification, and at the same time to do justice to a careful observer who I had been led to suppose had erred in the sexual identification of a species from the Levant.

Sycoscaptella? 4-setosa, Westwood.

In my last paper (Trans. Ent. Soc. Lond., 1883, p. 43) I described, under the name of *Sycoscaptella? 4-setosa*, a male insect which my two Ceylonese correspondents had forwarded to me as infesting the seeds of *Ficus asperrima*, and which appeared to me to be identical with the male insect described and figured by Dr. P. Mayer as the male of *Ichneumon ficarius*, the female of which, according to Dr. Mayer (represented in his pl. xxv., fig. 5), is furnished with an elongated exserted ovipositor arising near the extremity of a slender tubular joint as long as the remainder of the basal portion of the abdomen; such being also the structure of the female insect which I figured (Trans. Ent. Soc. Lond., 1883, Pl. VI., fig. 37) as the female of *Idarnella transiens*, of which the winged male is represented by me in fig. 36.

By accident the deflexed stigmal branch of the fore wings of the female was omitted in fig. 37, although represented in the adjoining fig. 40.

My identification of the sexes, and indeed my knowledge of the species, was derived from Sir S. S. Saunders, who kindly presented me with the specimens represented in my figures, and, on carefully re-examining them, I adhere to the opinion I then expressed that they represent the legitimate partners of a species infesting *Ficus indica*.

At the same time Dr. Mayer's statement as to the sexes of his *Ichneumon ficarius* is completely confirmed by the contents of a bottle received from the late Dr. Thwaites, with the following note :—

"Bottle No. 1 contains the sexes of two species found parasitic in the ripe fruit of *Ficus asperrima*, namely, (A). The large wingless males belong to the winged females of bright metallic colour and with long ovipositors, these latter organs being thickened at the joints. (B). The smaller (wingless) males may therefore be referred to the other winged females, black, with shorter ovipositors.

"The males of A are very active, and, after cutting open the fig at exactly the right time, may be observed scrambling about among the florets surrounding the inner wall of the central cavity, looking out for the females as they escape from their little prisons, laying hold of them with their jaws and strong legs, and not allowing them to escape till after *coitûs*, which occupies but a few seconds of time ; the females then at once fly away, and settle on the leaves of some neighbouring shrub or tree. These proceedings I have witnessed several times in this species; the males remain mostly within the central cavity of the fig, and are found dead after a very few hours. I have not seen the sexes of B *in coitû*."

This very precise statement leaves no doubt that the males of A are the legitimate partners of the bright-coloured females, and it fortunately happens that Bottle No. 1 contained a great number of specimens of each sex of each of the two species, B being a species of *Blastophaga*, with a male of the true Blastophagous form, whilst of A the numbers of each sex were nearly equal, the males being the *Sycoscaptella? 4-setosa* or the *Ichneumon ficarius* (male) of Dr. Mayer, and the females

being, as appears to me, identical with Dr. Mayer's *Ichneumon ficarius* (female), and which, with its details, is represented in the figures accompanying this notice (Plate XVI., figs. 1—1*f*). This female measures 2½ mm in length, the ovipositor, with its basal tubular sheath, being about 4 mm. long. It is of a rich shining orange colour, with the club of the antennæ dark brown. The mandibles are terminated by two teeth, the inner one rather oblong, the other (apical) one acute and trigonate. The palpi are distinct, the maxillary 4-jointed, the labial 2-jointed. This is an important character, since the male, as shown in Plate X., fig. 78, of this volume, is also palpigerous, thus proving that in this species at least both sexes have the lower parts of the mouth (maxillæ and labium) furnished with palpi. The thorax is compact and oval, the legs moderately long, of the normal form, the thighs not thickened, the tarsi distinctly 5-jointed. The abdomen has the basal portion oval, with two dark spots on the upper side beyond the middle; the penultimate joint is formed into a long slender cylinder, equal in length to the basal portion of the abdomen, furnished on each side with strong setæ; this is followed by another segment channelled beneath, as is the preceding joint. The ovipositor itself is extremely slender and curved, and arises within the base of a deflexed scale on the middle of the under side of the abdomen. The central portion of the ovipositor is defended by two demi-sheaths, which are marked throughout their whole length by small dark spots, from each of which a strong bristle is produced; these demi-sheaths are thickened at their tips, and their upper edge seems thickened by a slender back-piece. The joints of the antennæ beyond the annuli are marked with longitudinal impressed lines, which in some species of *Chalcididæ* seem to be represented by rows of setæ.

If this Ceylonese insect should prove to be absolutely identical with that described by Dr. Mayer, it will be proper to retain for it the specific name of *ficarius*, but, in default of the means of establishing this identity for want of specimens of the insect described by Dr. Mayer, I prefer to retain the specific name I bestowed on the male, *4-setosa*. The question of the generic name of this insect is also beset with difficulty. If we are correct in regarding the two insects, figured in my Plate VI., figs. 36, 37, as legitimate partners, with the generic name

of *Idarnella*, it will be clear that the insect now in question cannot be associated with them, although the structure of the female abdomen might be supposed to warrant such a step. On the other hand, there appear to be sufficient characters in the male *S. 4-setosa* to separate it from the type of *Sycoscaptella* (see Trans. Ent. Soc. Lond., 1883, p. 36, as compared with the description of the male *4-setosa* on p. 43), so that it may be necessary to establish another generic name for its reception. This step, however, I prefer to defer until I have made a more precise examination of some of the other long-tailed female fig-insects received from Ceylon.

Apocrypta, *Coquerel.*

In the memoir published by Dr. Coquerel in the 'Revue et Magasin de Zoologie' for August, 1855, on the species of hymenopterous insects infesting the *Ficus terragena* of the 'Ile Bourbon,' we find the following notice of this tree and the habits of its parasites, which merits republication in our 'Transactions,' which have already contained so many recent memoirs on fig-insects :—

"Le *Ficus terragena* est un arbre qui a souvent plus de dix mètres de haut ; ses fruits (*sycones*) sont fixés à de longs rameaux toujours dépourvus de feuilles, naissant des grosses branches et du tronc lui-même ; ils sont très-acides, et ne sont employés à aucun usage. J'avais remarqué plusieurs fois que de petits Chalcidites volaient à l'entour, et, voulant savoir aux dépens de quel insecte vivaient ces parasites, j'emportai plusieurs figues. En les ouvrant, j'y trouvai, non seulement un grand nombre de Chalcides, mais une infinité de petits insectes d'une forme très-singulière. Au milieu de la matière visqueuse qui réunit les drupes, et dans l'intérieur des drupes elles-mêmes, ils vivaient pêle-mêle, avec les Chalcidites, qui, selon toute apparence s'étaient développés à leurs dépens. Ces insectes sont très-lents dans leurs mouvements ; au moindre contact, ils se roulent sur eux-mêmes et demeurent immobiles. Leur taille égale a peine deux à trois millimètres ; ils sont dépourvus d'yeux et d'ocelles ; ils sont armés de puissantes mandibules. Mais malgré l'emploi de très-forts grossissements, je n'ai jamais pu découvrir chez eux ni palpes, ni mâchoires, ni trace d'aile ou d'élytre."

The insects described and figured by Dr. Coquerel are four in number, three wingless and one winged individuals. The winged *Chalcis explorator*, Coquerel, now proves to be a female *Sycophaga*: the *Sycocrypta cæca*, Coq., is the male of a species of *Blastophaga*: the *Apocrypta paradoxa*, Coq., is the male of a *Sycophaga*, of which the female is unquestionably the winged *Chalcis explorator* of Coquerel, agreeing with the female insect figured by me in our 'Transactions' (1882, Plate II., fig. 2).

The remaining wingless insect figured by Dr. Coquerel under the name of *Apocrypta perplexa* (*op. cit.*, p. 369, Pl. X., fig. 2) is smaller than *A. paradoxa*, "L. 4 à 4½ mil.," being 3 to 3½ mm. long, and differs from the latter insect (*cf.* Trans. Ent. Soc. Lond., 1882, Pl. II., fig. 1) in several important respects. It is comparatively much narrower, more cylindrical, with short mandibles acute at the tip but destitute of teeth on the inner margin; the antennæ composed of three joints, of which the basal joint is not dilated into a large oval plate; the clypeus forms an acute point between the insertion of the antennæ. "La lèvre inférieure présente une languette plus allongée que dans l'*A. paradoxa*." The abdomen is not quite so long as the thoracic segments, as wide as the posterior part of the thorax at its base, and gradually dilated till it becomes twice as broad as the head, "Ici les deux grandes trachées latérales ne viennent pas aboutir à des lames membraneuses (as in *A. paradoxa* or *Sycophaga*, male); elles se rendent à d'énormes stigmates qui sont situés sur la face dorsale de l'avant-dernier anneau. Ces stigmates sont munis, à leur partie supérieure d'un bourrelet saillant. L'extrémité de l'abdomen est muni d'une tarière semblable à celle de l'espèce précédente," and which "je suppose être la tarière qui sert à l'insecte à introduire les œufs dans les drupes dont est garni l'intérieur des fruits."

Among the numerous species of fig-insects forwarded to me by Mr. Stainforth Green and Dr. Thwaites from Ceylon, I found, as parasites upon *Ficus glomerata*, specimens of what appear to me to be identical with the three wingless insects figured and described by Dr. Coquerel. And it is to the *Apocrypta perplexa* that I now desire to call the attention of our Society; and which, with its various details, I have represented in Plate XVI., figs. 2—2*g*. On comparing these with the details of the male *Sycophaga*, given in Trans. Ent. Soc.

Lond., 1882, Plates II. and III., the structure of the front of the head, both on the upper and lower surface (Plate XVI., figs. 2 *a*, 2 *b*), as well as of the basal portion of the head (figs. 2 *c*, 2 *d*), the mandibles destitute of teeth, the antennæ destitute of the dilated basal joint, the possession of two small black spots near the base of the mandibles in the place of eyes, the ovate form of the abdomen destitute of the elongated lateral cerci, which seem replaced by the two horny plates described by Coquerel (of which I have not been able to define the structure), but which appear to me to be unprovided with the two singularly large lateral tracheæ of the male *Sycophaga* (of which I could observe no trace, although represented in Dr. Coquerel's figure),—are all sufficient to warrant the separation of *Apocrypta perplexa* from *A. paradoxa*, and, as the latter is now proved to be a *Sycophaga*, the retention of the name *Apocrypta* for *A. perplexa* will not perhaps be objected to. It was only after numerous dissections that I was able clearly to trace the two retinacula of the male, proving the exserted terminal appendage to be the male organ, and not, as supposed by Dr. Coquerel, the ovipositor of a female insect.

In the absence of specimens of *A. perplexa* from *Ficus terragena* for comparison with the Ceylonese ones from *F. glomerata*, it is not possible to determine the minute differences (if any) between Dr. Coquerel's and my insects. Mine vary in size from 1 to 2 mm. in length, and have the abdomen of a different form from Dr. Coquerel's figure. I have further to remark that the external envelope of the thoracic and abdominal segments is so extremely thin and transparent, that I cannot determine the absolute form of the posterior portion of each segment, which overlaps the base of the following segment to a considerable extent.

Explanation of Plate XVI.

Fig. 1. *Sycoscaptella ? quadri-setosa*, Westw., female.
1 *a*. Mandible of ditto.
1 *b*. Maxillary and labial palpi of ditto.
1 *c*. Labium and its palpi of ditto.
1 *d*. Antenna of ditto.
1 *e*. Ovipositor of ditto (basal portion).
1 *f*. Extremity of one of the sheaths of ditto.
2. *Apocrypta perplexa*, Coq., male.
2 *a*. Front of head of ditto, from above.
2 *b*. ,, ,, from below.
2 *c*. Basal portion of head, from above.
2 *d*. ,, ,, from below.
2 *e*. Extremity of abdomen of ditto.
2 *f*. Retinacula of ditto.
2 *g*. Teeth of retinaculum of ditto.

XVIII. *On the* Cynips Caricæ *of Hasselquist and other Fig-Insects allied thereto; with description of a new species from Australia.* By Sir Sidney Saunders, C.M.G.

[Read September 5th, 1883.]

Plate XVIII.

In the 'Proceedings' of this Society (1881, pp. xli—xlv) a discussion is recorded respecting the Fig-Insects collected by Hasselquist in the Levant about the middle of last century, as described in his 'Iter Palæstinum,' edited posthumously by Linnæus in 1757. One of his species, the *Cynips Caricæ*, could never have been seen by Linnæus, who, misled by the equivocal description thereof, subsequently united this species with Hasselquist's *C. Ficus* under the conjoint denomination of *C. Psenes*; the two being essentially distinct in many respects, though found in the same fig; the former (*inter alia*) having a very long ovipositor—described as "*corpore duplo longior*"—and the latter a very *short* one, as exemplified by his specimens still extant in the Linnean collection, the comparative length of which organ had been omitted in the original diagnosis. In fact these two insects must be referred to different families, as Dr. Paul Meyer has already suggested in his Treatise 'Zur Naturgeschichte der Feigeninsecten,' published in 1882 (p. 583); the first belonging to the parasitic races, and the second being a genuine fig-seed feeder (*Blastophaga*, Grav.)

I have lately received from an intelligent correspondent at Smyrna, Mr. C. D. Van Lennep, Swedish Consul there, whose attention had been directed to the subject, several specimens, now exhibited, apparently coinciding with this long-lost *Cynips Caricæ*. They were found, like those of Hasselquist, in the wild Caprificus figs of the autumnal crop which remain on the tree throughout the winter, their insect occupants hybernating therein in the larval state and being matured in the early spring. But Mr. Van Lennep, who has been unremitting in his researches to this effect, has also

obtained the same species in July from the second crop of these figs, which attain maturity at that period; and has forwarded a mass of their abdomens (10 or 12) with the ovipositors attached, found conglomerated together on one occasion inside a fig, serving to display the respective parts of the peculiar oviduct, as now exhibited. He has not, however, succeeded in finding the *C. Ficus* of Hasselquist, described as "*Corpus totum rufum*"; all the *Blastophagæ* met with in these figs being *nigro-æneous* in the females, like the *B. grossorum* of Gravenhorst. The apterous males have also abounded, but no specimens have been found which could be ascribed to the other sex of *C. Caricæ*, though many of the figs themselves have been transmitted at various periods.

Although the *C. Caricæ* had been confounded with the *C. Ficus* since Linnæus' time, yet in Dr. Paul Meyer's elaborate Treatise aforesaid the figure of an insect, apparently identical with these Smyrna specimens, though not described by him, is given under the name of *Ichneumon ficarius* of Cavolini (1782), together with that of its reputed male, a subapterous species closely resembling the *Sycoscaptella ? 4-setosa* from Ceylon, recently figured and described by Professor Westwood in our 'Transactions' (1883, p. 43; Plate X., fig. 76). These Smyrna specimens, no less than the female which has been attributed by Dr. Thwaites to the Ceylon subapterous species (as more recently reverted to by Prof. Westwood), structurally coincide with the female *Idarnes transiens*, Wlk. (*Idarnella*, Westw.) which has a *winged male* corresponding with its winged partner *mutatis mutandis*; both figured and described by Professor Westwood (*loc. cit.*, Plate VI., fig. 36, male; fig. 37, female; with details, figs. 38—42). Thus we are led to infer that, however closely these several species are assimilated in the one sex, a paradoxical divergence occurs among them in the other, not only as regards alary characters, but also in general structural disparity.*

* I have just received from Gallipoli, in Italy, a female specimen of the *Ichneumon ficarius* of Cavolini, which differs from the Smyrna specimens in its far less gibbous, more attenuated and elongate thorax and abdomen, seen laterally; and also one of its subapterous partners (according to Cavolini) apparently coinciding with the aforesaid *Sycoscaptella ? 4-setosa*, Westw., from Ceylon. Both were obtained alive in the early part of October from the third crop of the Caprificus figs—the so-called "*Mammoni*" of the Italians—the "*Fornites*" of Tournefort. Oct. 13th.

Hasselquist's description of *Cynips Caricæ* is lamentably deficient in many respects; while that of Cavolini's *Ichneumon ficarius* is contained in a memoir not readily accessible ('Opuscoli scelti sulle scienze e sulle arti,' vol. v., Milano, 1782), and is only casually mentioned by Dr. P. Meyer (pp. 564, 580, 583), whose figures, however, supply various supplementary details. A full diagnosis of these Smyrna specimens seems therefore essential; to which is appended that of a new species of *Idarnella* from Australia, whereof several examples have been found in the figs of *Ficus macrophylla*—all females with the characteristic ovipositor;—a species of *Sycoscaptella?* Westw., with very elongate tarsal setæ, being also met with in these figs.

Cynips Caricæ, Hasselq.

(Idarnella, *Westw.*)

(Ex individuis nuper in ficubus Smirnensibus declaratis descripta).

Fœmina. *Caput* parvum, subrotundatum. *Mandibulæ* rectæ, basi latæ, apice bidentatæ, dentes parum curvati. *Oculi* magni, ovales. *Ocelli* tres, capitis basin versus in triangulo dispositi. *Palpi* parvi. *Antennæ* geniculatæ, thoracis fere longitudinem æquantes; scapo elongato, subrecto, basi constricto apice truncato; articulo 2do clavato, curvato, præcedentis dimidio fere breviore, basi tenui; 3tio 4to 5to minimis, transversis, latitudine sensim crescentibus; sequentibus quinque scudiformibus, longitudine latitudinem vix excedentibus, basi subrotundatis, apice truncatis; reliquis tribus clavam fusiformem constituentibus. *Thorax* gibbus, ovalis. Pedes femoribus parum inflatis; tibiis subrectis, apice truncatis, angulo interno calcaratis, unguibus majusculis. *Pedes antici* breviores, tarsis parvis; *posteriores* quatuor elongati, tarsis longissimis. *Alæ anticæ* pellucidæ, nitidæ, disco setis parvulis instructæ, postice circiterque apicem fimbriatæ; vena postcostali apicem versus inspissata, usque costam excurva, ulna (Wlk.) radioque setis elongatis in serie dispositis; vena cubitali illo breviore in disco deflexa, parum excurva, tenui, vix clavata. *Alæ posticæ* aveniæ, sicut in anticis fimbriatæ. *Abdomen* dimidio basali lanceolato, thorace parum longiore, segmentis sex; dimidio apicali elongato, constricto, segmenta dua constituente, quorum primum tubiforme,

corneum, curvatum, apice sensim tenuius, truncatum, subtus anguste canaliculatum; extimum coriaceum penultimi trientis vel quadrantis fere longitudine, tubum infra disjunctum apice attenuatum simulans, utrinque puncto spiraculiformi processuque styliformi postice subtus porrecto instructum, quo tubo oviductus valvulæ basi obtectæ, subter apicem cum terebra hæ semel emergentes vel ex eodem per aditum inferne evadentes. Oviductus (terebra *sc.*) corpore fere duplo longior, valvulis ejusdem apicem versus sensim incrassatis, singulæ setis elongatis duplice serie munitæ; terebra ipsa capillaris, apice parum falcata, e valvula ventrali ad basin segmenti quinti abdominis emissa.

Idarnella Caricæ capite, thorace, pedibusque flavis, tarsis articulo extimo fuscato; oculis nigris; ocellis flavis; antennis basi flavis annulis inclusis, flagello fusco; alarum venis pallidis; abdomine flavo, fascia longitudinali dorsali a segmento 3tio usque ad apicem producta, segmentorum basi utrinque plus minusve transverse dilatata; segmento extimo fusco; oviductus valvulis nigris, terebra aurea, apice nigra. Long. corp. 4—4½ mm.; exp. alar. 4 mm.

Hab. Circa Smirnam, in *Ficus Caricæ* silvestris forma androgyna dictæ grossis (C. D. Van Lennep). In Mus. nostro.

The structure of the antennæ and wing-veins, as well as that of the abdomen and ovipositor, is precisely identical with the corresponding parts in *Idarnes transiens*, Wlk. (*Idarnella*, Westw.); the tubiform segment, hitherto regarded as appertaining to the oviduct, being followed by an overlapping segment about one-third, or one-fourth, of the length of the former, open along its under side and covering the base of the sheaths, which, together with the terebra, usually emerge below its obliquely-tapering apex, though these are occasionally deflexed through the channel beneath, thus leaving the greater portion of this covering segment extending beyond. These sheaths, closely approximated at their acuminate base, and articulating within the overlapping segment at about one-third of its length, are there connected with the nerves which govern their action, traversing the whole length of the elongate antecedent segment, and further traceable therefrom, in transparent specimens, through the ventral segments up to the base of the

terebra itself. This organ, affixed to a chitinous plate within the ventral region of the 2nd abdominal segment, effects its exit from within the ventral valve of the 5th, and enters the narrow channel that underlies the elongate tubiform segment, leading to the sheaths and their overlapping segment beyond; but, when separated from these sheaths, it may be readily released from below both retaining segments alike, as far as the ventral valve. This is acutely pointed at its corneous projecting apex, thus coinciding with Hasselquist's definition of "*Aculeus alius abdomen terminans*," &c.*: as in Prof. Westwood's description of this part in the *Cynipidæ* (Mod. Classif., &c., vol. ii., p. 127), "the venter being terminated by a pointed piece having a canal running along its middle, which is also produced considerably beyond its front margin in the shape of a *spine*; this is the terminal ventral segment of the abdomen." The analogy is sufficiently obvious, although the figure here referred to belongs to a different family.

In the elaborate descriptions and figures of various ovipositors in the several allied families, exemplified in the same assiduous work, "as typically represented" in *Pimpla instigator* (*loc. cit.*, p. 139; fig. 75, 8—13), the abdomen of the female exhibits "*eight dorsal* arcs, the eighth furnished at the tip with two minute styles. On the under side of the abdomen there only exist *seven ventral* arcs, from the last of which arises on each side a corneous elongated plate, which is the basal portion of the outer sheaths of the ovipositor; the apical portion of these sheaths varies greatly in length in different species, but the articulation always takes place near the extremity of the body." Thus the position of these sheaths in *Idarnella*, and their articulation towards the base of the overlapping segment, serve to indicate this, together with the elongate antecedent segment, as integral parts of the abdomen, the more especially as, exclusive of such prolongation, its dorsal arcs would be reduced to six; the ventral arcs being continuous beyond

* Hasselquist's full description is as follows:—"Cynips Caricæ. *Partes omnes ut in antecedente* (*C. Ficus !*). *Abdomen oblongum, tenuius quam in antecedente, utrinque parum acuminatum, a thorace distinctissimum. Spatium inter thoracem et abdomen angustissimum, longius. Aculeus caudæ unicus, corpore duplo longior, capellaris, versus caudam subtus carinatus, crassior, parumque pilosus, reliqua parte tenuis, glaber, æqualis. Aculeus alius abdomen terminans, minimus, crassiusculus, subrigidus.*" (*Iter*, p. 425).

the base of the projecting fifth. Moreover, in assigning these constricted segments to the *ovipositor*, the superaddition of the overlapping flap, covering the base of the sheaths but not attached thereto, would seem wholly inexplicable; while the presence of two lateral spiracles towards its apex, together with the usual apical styles and the subjacent acuminate process porrected beyond (ventral ?)—as shown in Plate XVIII., figures 1 *d*, *f*, *g*, *h*—constitute additional links in the chain of evidence identifying this with the terminal abdominal segment.

In a posthumous paper by Walker on "Insects destructive to the Fig in India," which appeared in the 'Entomologist' (vol. viii., p. 17; Jan., 1875), he describes a nearly-allied genus (*Polanisa*) as having the "*abdomen* more than twice the length of the thorax, tapering to nearly half its length, compressed and aculeiform from thence to its tip: oviduct longer than the body, emerging from the base of the abdomen; *sheaths* proceeding from the *apex of the abdomen*, slightly incrassated." He subjoins that "the form of the abdomen indicates that in the act of oviposition the *apical half of it* is inserted, as well as the sheaths of the ovipositor." "One specimen" (no longer traceable) is stated to have been obtained—from what source, however, or from what species of fig, or in what part of India, he does not mention;—but the terminal segments, which in *Idarnes transiens* he ascribed to the *oviduct*, are here assigned to the *abdomen*. In fact the elongate tubiform segment possesses *no duct* specially available for oviposition, the terebra being subsequently received from below and virtually independent thereof; the former apparently analogous to Burmeister's "*vagina tubiformis*," defined by him as "a mere continuation of the abdomen," and terminating in proximity to the bipartite sheath or valves of the oviduct (his "*vagina bivalvis*"), "into which," as he says, "the *vagina tubiformis* opens"; supplemented by the "valves corresponding with the last abdominal segment," which "appear as the cover both above and below at the base of the *vagina bivalvis* itself" ('Manual,' Shuckard's Trans., p. 194).

The following antipodean species of this genus, much smaller than the others referred to, entirely corresponds therewith in characteristic details:—

Idarnella aterrima, n. s.

Fœmina. Caput, antennæ, thorax, femora, tibiæ, abdominis dorsum, valvulæque oviductus, penitus nigri; ocelli diaphani; tarsi venterque pallidi; alarum venæ flavescentes, vena deflexa cubitali clavata, parum excurva, apice 4-pustulata; terebra rufo-picea. Long. corp. $2\frac{1}{4}$ mm.; exp. alar. $2\frac{1}{4}$ mm.

Hab. Australasiæ, prope Sydney, in *Ficus macrophyllæ* grossis sat frequens; nonnullæ dimidio fere minores. In Mus. nostro.

With regard to the Caprificus figs adverted to at p. 383, Count Solms-Laubach, in his erudite Treatise on the origin, domestication, and culture of the common fig-tree, *Ficus Carica*, L. ("Die Herkunft, Domestication und Verbreitung der gewöhnlichen Feigenbaums," Gottingen, 1882), observes, that from ancient times two different races of fig-trees were clearly defined, which have remained unchanged to the present day: the one comprising the countless varieties of edible figs cultivated everywhere; the other bearing inedible fruit which remains milky and hard up to the period of maturity, when it partially softens without acquiring saccharine juices, until it finally becomes shrivelled and desiccated. This tree is only cultivated in certain countries for special purposes, being mostly allowed to shoot up spontaneously or grow wild: the Greeks called it ἐρῖνεός (or ἐρῖνός); the Latins, "Caprificus." Hence the term "*caprification*"—an operation still in vogue in many regions while repudiated in others—on the efficacy of which the Count, after diligent investigation during a long sojourn at Naples, where this doctrine is generally accepted, pronounces as follows:—"Caprification is an operation traditionally practised in the same way from generation to generation, which, necessary in bygone ages, is now scarcely any more useful ('jetzt kaum mehr nützliche'), the scientific importance of which, as a means of evincing the changes our cultivated plants have experienced in the lapse of time, cannot be too highly estimated" (*op. cit.*, p. 44).

But the question of fact remains unsolved as regards the possibility of any benefit ever accruing from this system of hanging the Caprificus figs tenanted by the *Blastophagæ* upon the domestic fig-trees at a certain season, whether for the conveyance of pollen, or for

promoting the distension, maintenance, or maturity of the crop; the figs subjected to this process affording no proof of the actual presence of the *Blastophagæ* within the same: "or a single Caprificus-tree is planted in the fig-gardens, the passing of the insects to other trees *being left to chance*" (*Ibid*, p. 24).

Count Solms gives various interesting details from different writers respecting the habits of these insects,—of their forcible entrance into the wild figs by squeezing themselves between the scales of the "*Ostiolum*," where he had himself frequently noticed a quantity of their disrupted wings ("ganze Buschchen solcher abgestreifter Flügel," p. 20) left there in the persistent efforts they make to pass this barrier,—of their subsequent demeanour and oviposition, *their bodies being long recognisable within the cavity of the fig*,—and of the eventual egress of the succeeding brood, still, as he states, from between the scales of the *Ostiolum*. At Smyrna, however, these scales usually disappear ere then, leaving a free passage instead, which the fig-growers are accustomed to plug with a seed-pod of the asphodel, when transferring such infested figs from place to place for the purpose of caprification, an operation they deem so essential that, if these figs fail, as sometimes occurs, they import them from other far distant localities. He also narrates, that when the female *Blastophaga* effects her egress she "adjusts her wings, places them together, raises them perpendicularly, suns and dries herself, and cleanses her hairy (?) body with her feet *to free it from the adhering pollen*, wherewith she had become so begrimed in creeping through the crowning stamens that she seemed powdered all over"—thus effectually disposing of the *pollen* argument!

But we do not learn that the Count noticed any of these *disrupted wings* adhering in like manner to the scales of the *domestic figs*; or that he had discovered any such *bodies* in these, which in the other figs are *long recognisable within the cavity!* On the contrary, in adverting to an assertion of Godeheu de Riville ('Mémoire sur la Caprification,' Paris, 1755) that this writer "had also found them in ripe figs," the Count significantly adds—*which I did not succeed in doing* ("was mir nicht gelungen ist")! He could not have failed to detect them in Naples, where caprification is revered as a doctrine of faith, had they existed in

the latter; so that in both instances, as in that of the pollen also, there is a lack of evidence which it would be difficult to reconcile with any reputed virtues attributed to the caprification process.

Nevertheless a theory has been advanced by some Italian writers, whereon the Count enters into elaborate explanations of his own (p. 36), to account for the non-existence of any *brood* of these insects in the domestic figs, namely, that from some strange anomaly their ova are not suitably deposited, and consequently remain unproductive: whereon Dr. Paul Meyer, in his valuable Life-History of Fig-Insects, already referred to, after summarizing the Count's remarks on this head, illustrated by a copy of his Diagram (p. 560), observes—the reasons which render oviposition impossible here are not known! The explanation, however, would seem to be, that this hypothesis being necessarily dependent upon experimental essays made with figs laid open for the purpose of artificially introducing the *Blastophagæ* (which are otherwise not to be found therein), the rapid effects of partial desiccation ensuing on such occasions preclude the egg from attaining its proper position, being sometimes met with even reversed, with the pedicel pressed in forwards, as described in these experiments.

Others, however—among whom the Count cites several writers, including Olivier—have denounced this operation as an inveterate prejudice; and Gasparrini, of Naples, who had profoundly studied the subject, comes to the same "conclusion" (as quoted by the Count, p. 27), namely, "Abbiamo veduto con esperimenti che l'insetto non accelera la maturazione, ne fa allegare i frutti—e che però la caprificazione torna del tutto inutile per l'allegamento e la maturazione dei frutti; anzi dovrebb'essere abolita nella nostra agricoltura."

As regards the trees themselves, Gasparrini has shown that the *Caprificus* and its domestic associates appertain alike to the *F. Carica*, L.; for, after rearing a number of seedlings from three varieties of the domestic fig-tree, a few of which bore fruit in 1852, some corresponding with the latter and others with the former, he records his results as follows:—"Res itaque ad pristinum revocanda nam *Caprificus* et *Ficus* uti ex experimenta liquet sunt individui ejusdem speciei ex qua tot tantæque varietates et subvarietates promanant" (Solms, p. 19).

Explanation of Plate XVIII.

Fig. 1. *Idarnella Caricæ*, female, magnified.
1 *a*. Mandibles of ditto.
1 *b*. Antenna of ditto.
1 *c*. Abdomen and ovipositor of ditto, seen laterally.
1 *d*. Terminal segment apart.
1 *e*. Bipartite sheath of ovipositor of ditto.
1 *f*. Terminal segment, as seen *in situ*.
1 *g*. Ditto, in another position.
1 *h*. Ditto, seen transparently.
2 *a*. Antenna of *Idarnella aterrima*, female.
2 *b*. Abdomen and ovipositor of ditto, seen transparently.
2 *c*. Anterior portion of fore wing of ditto.

XIX. *Revision of the genera and species of* Malacoderm Coleoptera *of the Japanese fauna.* By Rev. H. S. Gorham, F.Z.S.

[Read September 5th, 1883.]

Part I.—LYCIDÆ, LAMPYRIDÆ.

Plate XVII.

In offering the descriptions of the many new species of beetles of the Malacoderm portion of Mr. Lewis' recent collection, I shall follow the example of other authors of descriptive papers submitted to this Society of prefacing them by a few remarks on the light they appear to throw on the distribution of animal life to this eastern limit of the globe. But I would first desire to say that we very much want a few guiding principles as to how the subject of distribution is to be approached, and to define at the outset whether we are referring to a supposed migration from one or more centres, or to, what is far oftener apparently intended, the development of the family or order within the district itself. To get a clear idea of this I think we may divide the genera and species of any family of sufficient importance into three categories :—

1. The generalised or undifferentiated type.
2. The ordinary type.
3. The specialised or much modified type.

Of these the first includes such genera as are found with little modification in far distant and dissimilar parts of the world, and I take to indicate an ancient settlement of the family wherever they occur. They are the unaltered representatives of the stock from which the rest have sprung.

The second embraces the larger number of both genera and species ; it is by its alliances and apparent migrations that we shall be able to gain an approach to a solution of those difficult problems of distribution, by land- or by sea-currents or by flight through the air, which occupy so many minds at the present moment.

In the third we only see the result of high development under favourable conditions for its taking place. The few genera in this category speak of a settled and prosperous home long enjoyed. They are the autocthones of the country and occupy a precarious position, from which any slight disturbance may speedily remove them.

Or, in other words, the presence of genera of the first category speaks of ancient settlement; of the second of permanent occupation; of the third of duration under favourable conditions.

In my first category I do not include such abnormal genera as combine the characters of two or three families, and are not satisfactorily placed in either. These I eliminate, as being only placed in either family for the sake of convenience; they are, according to my view, the living representatives of a still older stock, and are limited in distribution, and are rare just because they represent a bygone and still more generalised type. I speak here only of such genera as clearly belong to existing families. Among the *Lycidæ* there is a well-known genus in Europe, *Homalisus*. It is what I would call an *undifferentiated family* type, and one new genus from Japan, *Pristolycus*, seems a parallel case. This insect, with the general appearance of one of the *Lycidæ*, has the trochanters applied to side of the base of the femora, as in the neighbouring families; the antennæ are close at their insertion, as in *Lycidæ* and *Lampyridæ*; the middle coxæ are very close, as in *Telephoridæ*.

Similar cases of rare abnormal genera, as we sometimes call them, will occur to every one. I repeat, that while these are to me instances of my principle more broadly applied, in treating of the family I refer here to what are often called dominant genera, as, for instance, *Bembidium*, with its outlying small genera, among the *Carabidæ*; while *Amphizoa*, suggested to me by Mr. H. W. Bates, is an instance of the generalised *family* type.

To illustrate my idea, the family with which I commence this paper will serve my purpose as well as any other, better than some, for some other families may be deficient in the first or in the third categories, although abundant in species, with but a moderate degree of development in any particular direction. In the *Lycidæ* one of the most remarkable developments is the inflation of the elytra in the males. It is not my purpose here

to enter upon an explanation or suggestion of the purpose or function of any of these developments, but merely to point out the degree in which these seem to have taken place in the Japanese fauna. The inflated form is almost restricted to Africa, but finds its counterpart in the New World; it is joined to the production of the head into a rostrum. This form is only represented by a single genus, *Lycostomus*, in the East, and in Japan by but one species. Another form, which seems to me much modified, and to be the one to which the eastern line of development tends, is *Metriorhynchus*; this reaches its maximum in Australia, but is represented by but one species in Japan, so far as Mr. Lewis' collections have yet shown; the rostrum is still present here, but not any degree of inflation of elytra; but in its place a remarkable modification of thoracic structure takes place, a tendency towards which may be traced through many eastern genera. It is very common throughout the Coleoptera, and, I believe, in other orders of insects, to find a central channel on the disk of the prothorax; its probable use is explained by the attachment for muscles afforded by the corresponding inward projection; this, therefore, is no peculiarity of the *Lycidæ*, but in fact it gives way to another form, *viz.*, a carina, there being hardly any genus of *Lycidæ* with a simple channel from front to base of the thorax. And the peculiarity of the family consists in this, that not only is the channel converted into a carina, but that various carinæ are set up in various directions, reaching a maximum in *Metriorhynchus*. The most simple form, and that in which we see this change taking place incipiently, is found in a genus *Plateros*, which in its broad sense is found in all parts of the world, at least where any considerable number of the family are found. The channel is present here only at the base of the thorax; in front a carina is formed. The head is not rostrate; the antennæ are of the simple serricorn type. The elytra have the simplest form of striation, and the nearest approach to true punctuation to be found in the family, not differing so very much from that of the allied families of *Elateridæ*, or from the prototypical forms of *Lampyridæ* or *Telephoridæ*. This I would regard then as a representative of the undifferentiated type, and it is represented in Mr. Lewis' collections by one or two species which do not depart in any great degree from the North American species of the same genus.

Of the middle category, Japan has hitherto furnished us with some four genera, two of which, *Eros* and *Platycis*, are well-known Palæarctic and Nearctic forms; and the other two are Indo-Malay forms, which I should regard as *Eroid* genera, but less specialised, and nearer therefore to *Plateroid* forms than *Eros* is itself.

We have therefore in Japan a sort of picture or sample, as it were, of the whole *Lycidæ*. The number of species is small (only eighteen) if compared with those extending over a similar district of volcanic and forest-land, say in Tropical Central America, but fully equal to that of North America between similar latitudes, where some twenty-five occur over the whole of the United States, and large compared with that of Europe, from the whole of which only twelve species are known.

An attempt to summarise the facts here noticed leads one rather to negative conclusions, and such I think will be generally found to be the case. The Japanese does not appear to be a derived fauna, for the number of endemic forms is large both in proportion to the number of species and the size of the district explored. Extinction of species or of genera does not appear to have gone on so much as in the European side of the Palæarctic region. We have several genera of my first category pointing to an early settlement of this family here; while one genus is so remarkable as to suggest that it, like the anomalous genus *Homalisus*, represents the ancient synthetic type from which both *Lycidæ* and *Telephoridæ* and other sections of the Malacodermata have sprung,—I mean a new genus which I characterise in the present paper, but of which the proper location is doubtful, viz., *Pristolycus*.

In short, there is nothing in the Japanese genera of this section of the Coleoptera to lead us to think any movement of the species has taken place. One or two genera, as *Lycostomus* and *Metriorhynchus*, are the offshoots or exponents of the Indo-Malay and the Austro-Malay types of development respectively, but on the whole the reverse seems the fact, *viz.*, that the fauna of Japan is really endemic, and that its apparent relationship with the North American fauna will be explained by referring such genera as are found in common to the primitive types, which are universally distributed where not extinguished by local depauperation.

The following is a list of the species :—

LYCIDÆ.

Lycostomus modestus, Kiesenw.
Macrolycus pectinifer, Kiesenw.
Mesolycus (n. g.), *puniceus*, n. s.
Metriorhynchus geometricus, Kiesenw.
Eros erythropterus, n. s.
,, *oculatus*, n. s.
,, *spinicoxis*, Kiesenw.
,, *velatus*, n. s.
Platycis nasutus, Kiesenw.
Conderis orientis, n. s.
,, *pictus*, n. s.
Lyponia quadricollis, Kiesenw.
,, *delicatulus*, Kiesenw.
Plateros coracinus, Kiesenw.
Plateros purpurivestis, n. s.
,, *nothus*, Kiesenw.
,, *lineatus*, n. s.
Pristolycus (n. g.), *sagulatus*. n. s.

LAMPYRIDÆ.

Lucidina (n. g.), *accensa*, n. s.
,, *biplagiata*, Mots.
Lucidota ? *discicollis*, Kiesenw.
,, *fumosa*, n. s.
Luciola picticollis, Kiesenw.
,, *vitticollis*, Kiesenw.
,, *parvula*, Kiesenw.
,, *gorhami*, Rits.

LYCIDÆ,

Lycostomus modestus.

Lycus modestus, Kiesenw., Berl. Ent. Zeits., 1874, p. 250, nec *Lycostomus modestus*, C. Waterh., Ill. of Typ. Col. B. M., 1879, p. 11, pl. 2, f. 10,

Nagasaki and Kashiwagi.

Not very close to any described species; there is affinity to such species as *L. debilis*, Waterh., but the dull brown elytra, with greyish-black thorax, amply distinguish it.

Mr. Lewis met with the sexes in union in June. The males are the larger specimens, with longer and slightly more serrate antennæ.

Macrolycus pectinifer. (Pl. XVII., figs. 1, 2).

Celetes pectinifer, Kiesenw., Berl. Ent. Zeits., 1874, p. 251.

Cerceros pectinicornis, Kraatz, Deuts. Ent. Zeits., 1879, p. 127, pl. ii., f. 2; Bourg., Bull. Soc. Ent. Fr., (6), i., p. xlvi.

Lygistopterus flabellata, Mots., Schrenck, Reis., 1860, p. 114, pl. 7, f. 29. ?

Niger, elytris purpureis, sericeo-velutinis tenuiter quadricostatis, costa tertia obsoleta; prothorace antice carinato, postice carina perbrevi, medio fossulato. Long. ♂ 9—13 mm., ♀ 9—20 mm.

Mas. Antennis articulis 3—10 longe flabellatis, segmento ventrali ultimo longe lanceolato, medio latiusculo.

Fœm. Antennis serratis, segmento ventrali triangulari, apice exciso, subbimucronato.

Nikko and Fukushima; Nara; Junsai.

Maxillary palpi with the apical joint wider at its base than the preceding one, somewhat conical. Antennæ of the male with joints 3—10 gradually shortening in length, with lengthened flabellate branches, the end joint being finally nearly as long as the branch of the joint before it; the whole antenna about two-thirds of the body's length. Thorax rounded in front, but a little sinuate, varying in different specimens; in the larger ones (which have at the same time more crimson-red elytra) it is usually but slightly contracted before the hind angles, which are produced and very acute; in smaller ones, and in some which have browner elytra, there is a decided contraction of the sides immediately before this acute hind angle; the middle of the basal margin rises to meet the very short basal carina, but is scarcely emarginate. The elytra are either crimson, with a rich purple hue, or brown. I cannot consider the latter a distinct species; they are very closely covered with silky adpressed hairs; no punctures or reticulation whatever is visible.

Although this species varies so much in size and in colour, the larger specimens being more richly coloured than the smaller ones, yet from an examination of both the male and female types from Mr. Lewis' first collection there is no doubt the fine series of specimens brought by him from Nikko, Fukushima, and other places in the main island, belong to the species described by Kiesenwetter, who, however, failed to observe the split claws. Identified by Bourgeois with *L. flabellata*, Mots., but I feel doubtful on this point.

Mesolycus, n. g.

Characteres plerumque ut in *Macrolycus*, sed antennæ maris simpliciter serratæ, prothoracis latera antice convergentia, angulis posticis acutis haud valde productis; disco antice carinato. Ungues fissi, at maribus intermedii ungue anteriori tantum fisso. Type, *Mesolycus puniceus*.

This genus is remarkable, as being a second genus of *Lycidæ* with the claws split, or rather armed with a spine near their points, *Macrolycus* having been the only genus in which this kind of structure (which is frequent in the *Lampyridæ* and *Telephoridæ*) has yet been noticed.

In the present genus not only is the only species I have yet seen but of medium size, but what is very

interesting is that the males differ from the females in having the intermediate tarsi with only the anterior claw thus split. This is analogous to what occurs in the genus *Photuris*, and might not of itself be considered of generic value; the antennæ, however, differ as much from those of *Macrolycus* as in other genera founded by Mr. Waterhouse on that character.

Mesolycus puniceus, n. s. (Pl. XVII., figs. 3—3 *b*).

Niger, prothorace pube ferrugineo brevi parce vestito, elytris puniceis dense sed breviter pubescentibus, obsolete et indistincte punctatis; sutura, margine et lineis tribus elevatis, interiore obsoletiori, ante apicem abbreviata. Long. 8—10 mm., ♂. ♀.

Mas. Antennis quam feminæ, paullo longioribus, segmento sexto late et profunde exciso.

Nara; Junsai; Nikko.

Head with a short blunt rostrum; apical joint of the maxillary palpi very little widened, but subtruncate; 1st and 2nd joints of the antennæ pale on the inner side, their length about two-thirds of the body's length in the male. Thorax longer than wide, hardly differing in the sexes; the carina extending half the length of the disk, and towards the base ending in a flat elevation; the base widely, not deeply, transversely impressed. The head is a little more exposed in the male, owing to the thorax being a little smaller in that sex. The elytra are very similar in colour and structure to those of *M. purpureus*, but are deeper and more obscure in tint. They are nearly parallel in the male; in the female they widen a little after the middle; the suture is faintly sinuous, dehiscent after one-third, and narrowly black.

A considerable series of specimens, and in two instances the sexes united, were found by Mr. Lewis.

Metriorhynchus geometricus.

Eros geometricus, Kiesenw., Berl. Ent. Zeits., 1874, p. 256.

Cœnia Bourgeoisi, Harold, Stet. Ent. Zeit., xl., p. 333, 1879, ♀.

Metriorhynchus id., Bourg., Bull. Soc. Ent. Fr., (5), x., p. 149, ♂.

Kashiwagi; Nara; Fukushima; Junsai.

Two specimens (males) agree with the type of this species; these are entirely black, 8 mm. in length; the thorax with the usual seven areolets, the antennæ pectinate, but with these a considerable series of larger specimens appear to be conspecific, which have the elytra red-brown at the base for nearly half their length, owing to the scales with which their costæ and all the raised parts are thickly clothed being of that colour.

This insect agrees very nearly in colour with several *Lycidæ* from Borneo, Sumatra, and the adjacent islands, of which an account will be found under *M. infuscatus*, in 'Notes from the Leyden Museum,' vol. iv., p. 96, 1882. The rufous scales are no doubt very easily removed by friction or wet, which was probably the case with the specimens from which it was described.

Eros, *Newman*.

The type of *Eros* is *L. coccineus*, L., *aurora*, Herbst, and of English writers. The thorax has five areolets; the antennæ are simple, or only slightly serrate, much longer in the male than in the female. The elytra have the alternate four costæ more raised than the lines which separate the double rows of cells between them, of which there are thus ten between the suture and the margin. This definition will exclude such species as *D. affinis*, Payk., and *L. minutus*, F., for which the genera *Pyropterus*, Mulsant, and *Platycis*, Thompson, are adopted by all students of the *Lycidæ* now. But one of the species described by Kiesenwetter as *Eros* can be referred to that genus; they will be found here under the genera to which, in the present state of the systematic arrangement of this family, they pertain. Two species, *Eros granicollis* and *E. atrorufus*, Kiesenw., Deuts. Ent. Zeits., 1879, p. 305, I cannot refer to their proper genera, or identify with any of Mr. Lewis' species. No size is given, but they are, I suspect, *Platerotes*. Mr. Lewis' last journey has proved, however, that true *Eros* are in Japan.

Eros erythropterus. (Pl. XVII., fig. 7).

Niger, prothorace elytrisque læte coccineo-rufis illo disco subinfuscato. Long. 7—9 mm.

Mas? Antennis corporis fere longitudine, fere simplicibus, articulo tertio quam secundus paullo longiori.

Oyayama, flying round an old tree in April, 1881.

This elegant species is so near *E. coccineus*, L., that it will suffice to point out the difference. It is of course much smaller than average specimens of that insect. The antennæ are longer and thinner, less compressed, and with the 3rd joint smaller than in the males of *E. coccineus*. The thorax has in its centre a wide lozenge-shaped area; in *E. coccineus* this area is joined to the base by a short carina; here its apex is *on* the base.

Eros oculatus.

Niger, prothorace infuscato, margine toto tenuiter rufo, elytris rubricatis. Long. 7—8 mm., ♂, ♀.

Mas. Antennis quam corpus paullo brevioribus, oculis subglobosis, prominentibus.

Femina. Antennis brevioribus, oculis haud prominentibus.

Hakone and Miyanoshita.

Closely allied to the last species, smaller, with more prominent eyes, and the whole disk of the thorax pitchy black, or at least infuscate; in addition to these distinctions the thorax is proportionally smaller, the ridges separating the areolets are not so much raised, and the transverse one dividing the two front ones from the two posterior is not carried so far back towards the hind angles. Of the elytra the intercostal spaces are narrower, and the double row of square meshes not so even or so distinct.

The single female specimen is smaller than the two males met with by Mr. Lewis; this is no doubt merely accidental.

Eros spinicoxis.

Eros spinicoxis, Kiesenw., Berl. Ent. Zeits., 1874, p. 254.

Konose; Nara; Nikko; Fukushima.

When this species is in fine condition the elytra appear brownish red from the fine pubescence with which they are covered; other specimens are quite black. I have carefully examined the female type specimen, as well as several others identical, as I think, with it, of both sexes, and I cannot discover the coxal spines mentioned by Kiesenwetter. The trochanters are triangular and dentiform, as is usual in this family; the coxæ appear to me to be quite simple. This cannot be considered a

typical *Eros*, having but three distinctly raised costæ; the 1st costa is often abbreviated beyond the middle, the 2nd and 3rd start almost together from the humerus, and the space between the 2nd and 3rd is wide at the base, with a short intervening line representing the 4th.

Two specimens, a male and a female, taken at the same time as others of this species at Fukushima, have the antennæ decidedly shorter, with more nearly quadrate joints, but I hesitate to consider them as specifically distinct at present.

Eros velatus, n. s.

Niger, thorace subnitido; elytris subopacis, interstitiis alternis et margine squamulis purpureis vestitis. Antennis vix serratis. Long. 10 mm., ♀.

Kobe, on Maiyason.

This *Eros* is very similarly coloured to several other *Lycidæ*, both from Japan and from the Malay district, in being black, with the interstices (at least for a great part of their length) covered with reddish velvety scales. It is, however, the first species of *Eros* which I have found so coloured, and the scales are brighter crimson than in any of the allied species, nor do they extend to the intervals or transverse ridges. The thorax has a distinct central diamond-shaped areolet. All the five areæ are uneven in their surfaces; the intervals of the raised interstices have distinct reticulate cells in a double series; the 2nd and 3rd of the raised interstices unite before the apex. It is a rather broad and flat species, and I think will be easily recognised; at present only a single female specimen has been found.

Platycis nasutus.

Eros nasutus, Kiesenw., Berl. Ent. Zeits., 1874, p. 255.

Nikko; Miyanoshita; Oyama; Oyu.

Platycis is one of the best of the modern divisions of *Eros*, Newm., adopted from Thomson, Skand. Col., vi., p. 162, by C. Waterhouse. Trans. Ent. Soc. Lond., 1878, p. 101, for *Eros* (*Lycus*) *minutus*, F. So far as I know no other species has yet been referred to it. The present insect entirely agrees with the generic characters presented by *P. minutus*. The areolets in neither, however, can be said to be well defined. The most striking

characteristic is that there are three nearly equal and squarish pits in front, while behind there are two lateral ones opening into a very short central groove. The excavated production of the head in front is very remarkable. *P. nasutus* differs from *P. minutus* in its more sordid yellow colour; in the thorax not being black but pitchy, with yellow ridges and margins; and in the coarser sculpture of the elytra, which are also not clothed with minute scales. The antennæ in *P. minutus* have the apex yellow; this is not the case here.

Conderis, *Waterhouse* [Ill. Typ. Col. B. M., p. 59.]

The genus *Conderis*, as proposed by Mr. Waterhouse for *Calopteron signicolle*, Kirsch., has the thorax with four areolets, and a central diamond-shaped groove, and the antennæ simply serrate, but with the apical joints diminishing in width, in the degree of serration, and obliquely truncate at their apices. To this type he has united a species from India, *C. major*, Waterh., and I have described a third, *C. miniatus*, from Sumatra ('Notes from the Leyden Museum,' iv., p. 98, 1882). The central channel, groove, or fossa increases in dimensions in some nearly-allied genera, which should, I think, all be placed in the subfamily *Erotides*, till it forms an open lozenge- or diamond-shaped areolet, whose angles reach the front and hind margins and sides, or nearly so (*Taphes*, *Pyropterus*). The two species now described are typical *Conderides*, having a small central pit, formed as it were by the divided carina on the disk of the thorax, and united laterally with the side margin by a transverse ridge, running a little back, and faintly sinuous.

Conderis orientis, n. s.

Ater, opacus, thoracis carinulis et marginibus parum nitidis, elytris striga humerali, sutura, margine, et costis pube purpureo micantibus, antennis maris corporis fere longitudine; feminæ brevioribus. Long. 7½—9 mm., ♂, ♀.

Var. Elytris nigris striga humerali tantum purpurea.

Nara; Fukushima; Oyama.

The rufous appearance of the margins, suture, shoulder-stripe, and costæ is owing to a velvety pile,

which is no doubt easily removed by wear or any friction. The antennæ of the male are more distinctly serrate from the 3rd to the 8th joints, and are fully one-quarter longer than those of the female. The latter is the smallest of three examples of this species found by Mr. Lewis, and, as the same difference in the antennæ is the case in the next species, it may be generally so in this genus.

Conderis pictus, n. s. (Pl. XVII., fig. 4).

Præcedenti simillimus, elytris striga humerali, plagaque subapicali læte carminea. Long. 8—9 mm., ♂, ♀.

Odaigahara, in Yamato, June 22nd, 1881.

The elytra in this species have an elongate and rather wide stripe, equal in length to about one-third of the elytra, of a beautiful crimson-red before the apex, leaving, however, the entire margin black. Although from the two examples (which are all Mr. Lewis secured) I cannot point out any structural or other difference than that of colour, I feel confident it will prove to be a distinct species. The larger specimen is a male.

Lyponia quadricollis. (Pl. XVII., figs. 5, 6).

Celetes quadricollis, Kiesenw., Berl. Ent. Zeits., 1874, p. 252.

Eros militans, Kiesenw., *loc. cit.*, p. 253, ♀.

Nagasaki; Kobe; Miyanoshita; Subashiri.

Celetes was proposed by Newman for a North American species, *C. basalis*, Lec., which may be described as a *Calopteron*, with the antennæ pectinate in the male. The present insect, however, has nothing to do with that type, but is very closely allied to the species for which Mr. Waterhouse proposes *Lyponia* (*L. debilis*, Waterh., Types of Col., p. 25), and with which it should clearly be associated. The genus is allied to *Plateros* by its thoracic groove, and elytra with ten even rows of punctures, the alternate costæ being sometimes raised. It differs from it in the pectinate antennæ and more quadrate thorax.

L. quadricollis is readily distinguished by its bright red elytra and evenly punctured striæ; it varies from 8 to 12 mm. in length. It was rather commonly met with by Mr. Lewis.

Eros militans, Kiesenw., according to the type in Mr. Lewis' collection, is simply a rather faded female example of this species.

Lyponia delicatulus.

Eros delicatulus, Kiesenw., Berl. Ent. Zeits., 1874, p. 254[1].

Nagasaki[1]; Yuyama; Oyama; Miyanoshita.

It is rather singular that Herr Kiesenwetter appears not to have noticed the close affinity between this insect and *L. quadricollis*. The thoracic sculpture is the same, and the most striking difference (apart from its smaller size and more delicate build) is that the 4th and 6th interstices are raised, the former running into the suture near the apex.

Plateros coracinus.

Eros coracinus, Kiesenw., Berl. Ent. Zeits., 1874, p. 257[1].

Nagasaki[1]; Kobe; Yokohama; Nara; Nikko; Sawara; Ontaki.

Of this species Mr. Lewis brought home about a dozen specimens, half of which seem to be of a larger and half of a smaller form. The larger ones, which are of both sexes, have the alternate interstices a little more distinct; in the smaller ones they are almost evenly raised; these are also greyer black, but the difference is altogether too minute to be specific.

The males have the eyes more globose and prominent; the abdomen is clearly of nine segments, the 8th only appearing ventrally as lobes on each side of the 9th narrow segment; the 7th is not emarginate, but all the plates are pubescent at their margins.

There does not appear to be any very striking generic difference between these species and New World *Platerotes*; yet I think the Eastern Tropical and African forms might very conveniently be separated under the term *Planeteros* (*cf.* Gorh., Ann. del. Mus. Civ. di St. Nat. Genova., vol. xviii., 1883).

Plateros purpurivestis, n. s.

Niger, prothorace brevi, angulis posticis acutis, disco nitido haud canaliculato vel carinato, inæquali; elytris squamulis purpureis dense vestitis. Antennis serratis. Long. 6 mm.

Fukushima.

As there is but a single specimen of this it will be better to merely indicate it here than to give a longer description. The elytra, which appear of a rich brown hue from the scales which clothe them, will sufficiently distinguish it in its genus.

Plateros ? nothus.

Eros nothus, Kiesenw., Berl. Ent. Zeits., 1874, p. 258.

Otsu; Biwa Lake; Nara; Samegai; Kobè.

I should not like to make a genus for this insect without further acquaintance with the types of some other Eastern *Platerotes* and *Calochromi*, described by Mr. Waterhouse, but which, owing to the removal of the collections of the British Museum, I am unable to make at present. It combines certain characters of both genera, having a rude obsolete channel on the disk of the thorax, with a short oblique ridge starting from a little above the hind angles on each side of the thorax. The antennæ also are unlike those of *Plateros*, having a distinct bead-shaped second joint, and those following not compressed nor serrate, but pubescent; all these characters indicating a type but little developed, and highly synthetic.

Seven specimens were taken by Mr. Lewis in 1881.

Plateros ? lineatus, n. s.

Nigro-fuscus, prothorace brevi disco carinato et per carinulam transversam sinuatam in areolas quatuor diviso, elytris quadricostatis, intervallis serie duplici punctorum, costis (præsertim externis) et ad basin brunneis, squamosis. Long. $6\frac{1}{2}$—7 mm.

Kashiwagi.

This is again a form unknown to me, but for which I do not at present think it well to institute a genus. Of

two specimens taken by Mr. Lewis, one has rather longer antennæ than the other, and is no doubt the male ; they are scarcely serrate in either specimen.

It bears a strong resemblance to *Eros velatus*, but the thorax is divided into four areolets, something as in *Conderis*. The elytra appear firm and rather flat, with the four costæ evenly raised, but the 1st and the 3rd terminate before the apex.

Pristolycus, n. g.

Caput oculis mediocribus, antennis quam corpus brevioribus, leviter serratis, 11-articulatis. Thorax transversus, antice angustatus, angulis posticis prominulis subacutis, marginibus parum reflexis, disco obsolete crebrius punctato, leviter et obsolete canaliculato. Scutellum integrum. Elytra haud reticulata, creberrime confluenter punctata, costis tribus ante apicem desinentibus. Pedes mediocres, tarsi quinque-articulati, articulo tertio obconico, quarto subtus longe lamellato.

Pristolycus sagulatus, n. s. (Pl. XVII., fig. 8).

Niger, subnitidus, prothoracis marginibus antice piceis, elytris roseo-miniatis, prope suturam infuscatis, margine, sutura et costis nigris, scutellum nigrum punctulatum. Long. 10 mm., ♂? ♀.

Junsai.

The very remarkable insect for which I propose this genus has the general appearance of being one of the *Lycidæ*. It presents, however, so many points in which the structure is divergent from the family that its position is doubtful. The antennæ are closely inserted on the front of the small head, which is sunk in the prothorax. The maxillary palpi have their apical joint cylindrical, and the labial are small, not enlarged at the apices. The middle coxæ are separated only by a narrow ridge of the mesosternum. The trochanters are small pieces closely applied to the bases of the femora. Of the abdomen I cannot speak precisely, the specimens having shrunk a good deal ; they may all be females, and I can only detect six ventral segments ; at all events the structure is not dissimilar to that of many female *Lampyridæ*. It is black, with no indication of being luminous. The prothorax has the hind angles turned

outwards, a character very unusual in the *Lampyridæ*, but common in the *Lycidæ*. Till we can ascertain the sexes it is hardly possible to say more about this insect.

LAMPYRIDÆ.

Lucidina, n. g.

Lucidotæ affinis; antennæ compressæ, maris leviter serratæ, feminæ breviores simplices. Ungues (maris) anteriores basi valde uncinato-dentati, interiores subdentati.

Lucidina accensa, n. s. (Pl. XVII., figs. 9—9 *c*).

Nigerrima; prothorace roseo, fusco limbato, vitta mediana sat lata, ad basin transversim expansa nigra, abdominis segmentis tribus ventralibus apicalibus cum pygidiali roseo-diaphanis. Long. 13 mm., ♂, ♀.

Mas. Unguibus anterioribus basi, dente acuto curvato armatis.

Nara; Tokio.

Much larger than *L. biplagiata*, Mots. (*vulnerata*, Kies.), and the claws with a much more acute and longer tooth. The antennæ are wider, and the thorax more vividly coloured. Four specimens.

Lucidina biplagiata.

Lucidina biplagiata, Mots., Bull. Mosc., i., p. 167.
Lucidota vulnerata, Kiesenw., Berl. Ent. Zeits., xviii., 1874, p. 260.
L. angusticollis, Kiesenw., *l. c.*, p. 261.

Kobe; Hitoyoshi; Junsai; Nagasaki; Hiogo; Yokohama; Yuyama; Nara; in May and June.

Met with again, but not apparently in great numbers, by Mr. Lewis. The tooth on the claws of this species is much less conspicuous than in *L. accensa*. After examining the type of *L. angusticollis*, kindly lent me by Mr. Lewis, I can only come to the conclusion that it differs from other males of *L. biplagiata* through an extraordinary malformation of the pronotum.

Lucidota ? discicollis.

Lucernula discicollis, Kiesenw., *loc. cit.*, p. 258.

Nagasaki ; Kobe ; Kashiwagi ; Nara.

Neither this nor the following species are typical *Lucidotæ*, being more ovate, and having diaphanous patches on the thorax in front.

Lucidota ? fumosa, n. s.

Nigro-fumosa, opaca, prothorace antice angustato rotundato, areolis duabus translucidis.

Fukushima, and Tsukuba-yama.

Nearly of the same form and characters as *L. discicollis*, but the thorax narrows much more in front, and has no discal yellow patch.

About six specimens were met with.

[*Lucidota tabida*, Kiesenw., *loc. cit.*, p. 259.]

Yokohama.

I examined the type of this, and believe it is only an immature and discoloured specimen of *L. biplagiata*, and by no means fitted for a type of such a soft insect.

Luciola picticollis.

Luciola picticollis, Kiesenw., *loc. cit.*, p. 262 ; Gorh., Trans. Ent. Soc. Lond., 1880, p. 102.

L. cruciata, Harold, Deuts. Ent. Zeits., 1877, p. 357 (nec Mots.)

Hakodatè ; Junsai ; Samegai.

Most of the specimens are from the last-named place, taken in July.

Luciola vitticollis.

Luciola vitticollis, Kiesenw., *loc. cit.*, p. 261 ; Gorh., Trans. Ent. Soc. Lond., 1880, p. 108.

Tokio ; Yuyama ; Hitoyoshi ; Nikko.

This is the larger species, according to Kiesenwetter's description, and is one of the finest in the genus. The thorax is sometimes without the vitta.

It occurred in May.

Luciola parvula.

Luciola parvula, Kiesenw., *loc. cit.*, p. 263.

This is a small species of the *L. indica* type, but with the red thorax partly infuscate, and (with the head) coarsely punctate ; the elytra are also strongly punctured and substriate.

There is only one specimen (a male) in Mr. Lewis' collection now; it is distinct from any other species I have examined.

Luciola gorhami.

Luciola Gorhami, Ritsema, Notes from the Leyden Museum, v., p. 4 [1882].

L. affinis, Gorham, Trans. Ent. Soc. Lond., 1880, p. 101 (nec Ritsema, Tijdschr. v. Ent., xviii. (1875), p. 129).

L. præusta, Kiesenw., *loc. cit.*, p. 263 ; Lewis, Cat. Col. Jap., p. 17, No. 1206 (nec. Eschscholtz, Entom. i. (1822), p. 57).

The differences between this species and what I regard as *L. vespertina*, Fab., have been pointed out by me in the place cited. I have seen no reason to alter my opinion as to the distinctness of either this or other forms of the *vespertina* group ; but great confusion exists in the synonymy. I cannot yet tell what the type of *L. japonica*, Thunb., may prove to be, but the description (Fab., Mant. i. 162) does not point to this species : "*L. flava* segmento abdominis antepenultimo nigro. . . Tota flava, antennis, oculis, alis segmentoque abdominis antepenultimo nigris" ; for the insect, of which there is a single specimen in Mr. Lewis' collection, is closely allied to *L. vespertina*, has the head black, as well as the apex of the elytra, and has the antepenultimate segment entirely yellow. Olivier (Ent. ii., No. 28, 19) expressly says, "La tête est d'un jaune fauve, avec la partie supérieure et les yeux noires." It must be remembered that all authors are but following Thunberg, who after all may have been describing a Cape of Good Hope insect. I propose therefore to omit *L. japonica* from the list at present.

[*Luciola lateralis*, Mots., Schrenk, Reis., 1860, p. 114 ; Lewis, Cat. Col. Jap., p. 17, No. 1208. Referred to Dauria, E. Siberia, by Motschulsky. I have not seen it from Japan.]

Explanation of Plate XVII.

Fig. 1. *Macrolycus pectinifer*, male.
2. ,, ,, female.
3. *Mesolycus puniceus.*
3 *a*. Claws of hind leg of male.
3 *b*. Claws of middle leg of female.
4. *Conderis pictus.*
5. *Lyponia quadricollis*, male.
6. ,, ,, female.
7. *Eros erythropterus.*
8. *Pristolycus sagulatus.*
9. *Lucidina accensa.*
9 *a*, 9 *b*. Claws of ditto, male, showing the outer and inner claws, middle leg.
9 *c*. Terminal ventral segments of ditto, male.

The details of the claws are magnified about 60 diameters.

XX. *First Report on the* Rhynchota *collected in Japan by* Mr. George Lewis. By W. L. Distant.

[Read November 7th, 1883.]

Plates XIX, XX.

Of the extensive and interesting collection of *Rhynchota* made by Mr. Lewis, the present paper deals with the families *Pentatomidæ*, *Coreidæ*, *Lygæidæ*, and *Pyrrhocoridæ*, with a few supplementary descriptions of species belonging to the *Reduviidæ*. The first four families alone are, however, now enumerated, the identification of the remaining Heteroptera and the small collection of Homoptera being reserved for a second paper. The present enumeration comprises 109 species, of which 33 are described as new; and three new genera are also proposed. The supplementary or anticipatory descriptions of *Reduviidæ* refer to four species, thus making a total of 37 presumed novelties.

The present material supports the conclusion that the Japanese subregion of the great Palæarctic region possesses but few European or Siberian species, and, what was much less expected, that those from the Amur are also, as a rule, distinct. Thus I formerly received a species of the genus *Tropicoris* from Japan, which seemed so to agree with the description of the Amurian *T. metallifer*, Motsch., that I had little doubt as to its identity. On subsequently receiving the true species from the Amur, I found that the Japanese specimens were alike in colour and size, but strikingly distinct in the structural character of the pronotal angles. Mr. Scott, who dealt with the former collection made by Mr. Lewis, also enumerated the common European species *Gastrodes* * *ferrugineus*, but in the same year the late Dr. Stål—who was no specific splitter—described the Japanese insect as a distinct species. The European species which I have found in these families are—

* The generic name *Platygaster*, as used by both Scott and Stal, is preoccupied in Hymenoptera; I have therefore followed Dr. Puton in substituting that of *Gastrodes* of Westwood.

Eurygaster maurus.
Zicrona cærulea.
Carpocoris nigricornis.
Dolycoris verbasci.
Rubiconia intermedia.
Tropicoris rufipes.
Corizus maculatus.
,, *crassicornis.*
Lygæus equestris.

These are all familiar names of abundant species, and the inference which I thereby assume is, that when European species are found in Japan they are those which are widely distributed throughout the Palæarctic region. Another very noticeable and peculiar character in such species—and one that has been already pointed out by the specialists in other orders—is in the large size they attain in Japan, *Carpocoris nigricornis* and *Tropicoris rufipes* being particularly developed in that respect, and the same statural increase is also evident in widely distributed species of the Oriental region when found in Japan, as is strikingly shown by *Plautia fimbriata*.

As regards the Oriental affinities of the Japanese Rhynchotal fauna much greater difficulty exists in forming an opinion, owing to the imperfection of the little-worked Oriental specific record. When the species of that region are even approximately enumerated, some of these now first described from Japan will doubtless be found to have a far wider range of habitat, and therefore it would be unscientific and misleading to speak of any of the species here described as endemic till we know more of the surrounding Rhynchotal faunas.

It is clear, however, that the Oriental species found in Japan are very considerable, and the conclusion derived from these imperfect data is that, as might reasonably have been predicted, the Rhynchotal fauna of Japan has been largely derived from Palæarctic elements derived from and by the north, and from Oriental species which have evidently and necessarily entered by the south.

The following is an enumeration of the species belonging to the families to which this paper principally refers:—

PENTATOMIDÆ.

PLATASPINÆ.

Coptosoma cribraria, Fabr., var. .. Yokohama, Nagasaki.
,, *biguttula*, Motsch. .. Nagasaki.

CYDNINÆ.

Cydnus nigritus, Fabr. .. .. Yokohama, Sendai.
Geotomus punctulatus, Costa, var. .. Yokohama, Nagasaki, Hitoyoshi.

Macroscytus javanus, Mayr .. .. Hakodatè, Kashiwagi, Kurigahara.
Chilocoris nitidus, Mayr .. .. Kobé.
Canthophorus triguttatus, Scott .. Kumamoto, Ichiuchi.
,, *niveimarginatus*, Scott. Nagasaki, Hiogo, Seba.
,, *variegatus*, n. s. .. Sapporo.

SCUTELLERINÆ.

Pœcilochroma lewisi, n. s. .. .. Yokohama, Nikkô, Kashiwagi.
Eurygaster maurus, Linn. .. .. Nikkô, Seba.

ASOPINÆ.

Zicrona cærulea, Linn. .. .. Yokohama, Shichinohè.
Neocazira confragosa, n. g. and s. .. Suyama.
Picromerus lewisi, Scott. .. .. Hakodatè, Fukushima.
,, *similis*, n. s. .. .. Hakodatè.
Neoglypsus viridicatus, Dist. .. Chiuzenji.

PENTATOMINÆ.

Bolbocoris reticulatus, Dall. .. .. Kobè, Shimonosuwa, Wada togè.
Graphosoma lineata, Linn. .. .. Hakodatè.
Scotinophora lurida, Burm. .. .. Yokohama, Nagasaki.
,, *scottii*, Horv. .. .. Konosè, Osaka, Fusan.
,, *horvathi*, n. s. .. .. Yokohama.
Erthesina fullo, Thunb. .. .. Yokohama.
Laprius gastricus, Thunb. .. .. Nagasaki.
Ænaria lewisi, Scott .. .. .. Yokohama, Hiogo.
,, *assimulans*, n. s. .. .. Nagasaki.
Halyomorpha picus, Fabr. .. .. Nikkô, Yokohama, Nagasaki, Ogura Lake, Kashiwagi.
Palomena angulosa, Motsch. .. Hakodatè, Fukushima, Kashiwagi, Yagohara.
Rubiconia intermedia, Wolff. .. Fukushima.
Carpocoris nigricornis, Fabr. .. Hakodatè, Yagohara.
Dolycoris verbasci, DeGeer. .. .. Hakodatè, through Nara.
Ælia fieberi, Scott. .. .. .. Tokio, Kobè, Shimonosuwa.
Sepontia ænea, n. s. .. .. .. Kumamoto, Yuyama.
Stollia guttigera, Thunb. .. .. Yokohama, Nagasaki.
,, *lewisi*, n. s. .. .. .. Awomori, Niigata, Urasa and Seki.
Carbula humerigera, Uhler. .. .. Kashiwagi, Kobè.
Eurydema rugosa, Motsch. .. .. Hakodatè, Fukushima.
Alcimus borealis, n. s. .. .. Nara.
Parastrachia fulgens, n. g. and s. .. Yokohama, Konosè.
Nezara antennata, Scott. *N. viridula*, Linn., var. ? .. .. Kumamoto, Kioto.
Plautia fimbriata, Fabr. .. .. Nagasaki, Ichiuchi.
Menida violacea, Motsch. .. .. Fukushima, Yagohara, Shimonosuwa, Niigata.
,, *japonica*, n. s. .. .. Nagasaki.
Piezodorus rubro-fasciatus, Fabr. .. Yokohama.
Tropicoris rufipes, Linn. .. .. Hakodatè, Buno.
,, *japonicus*, Dist. .. .. Hakodatè.
Compastes obtusa, Walk. .. .. Hiogo.

ACANTHOSOMINÆ.

Acanthosoma distincta, Dall. .. Yokohama, Nikkô, Hakodatè, Fukushima.
Sastragala scutellata, Scott. .. .. Hiogo.

Clinocoris nubilus, Dall. .. .. Yokohama, Bukenji, Oyama.
,, *putoni*, Scott. .. .. Yokohama, Kobè.
,, *signoreti*, Scott. .. .. Horobetsu.
,, *gramineus*, n. s. .. .. Chiuzenji.
Urochela luteovaria, Dist. .. .. Fukushima, Tagami, Seba.
Urostylis striicornis, Scott. .. .. Hakodatè, Fukushima.

DINIDORINÆ.

Megymenum tauriformis, n. s. .. Kashiwagi, Nara.

PHYLLOCEPHALINÆ.

Gonopsis affinis, Uhler. .. .. Yokohama, Hakodatè, Nagasaki.

COREIDÆ.

COREINÆ.

Prionolomia fuliginosa, Uhler. .. Nikkô, Chiuzenji, Hakodatè, Seba, Kurigahara.
Homæocerus unipunctatus, Thunb. .. Nagasaki.
,, sp. undeterm. .. .. ——
Pachycephalus opacus, Uhler. .. Yokohama, Nagasaki.
Acanthocoris sordidus, Thunb. .. Yokohama, Nagasaki, Mayebashi.
Cletus rusticus, Stal. .. .. .. Yokohama, Nikkô, Nagasaki.
Megalotomus costalis, Stal. .. .. Tagami.
Riptortus clavatus, Thunb. .. .. Hitoyoshi, Kioto.
Paralepsius unicolor, Scott. .. .. Nikkô, Kobè.

CORIZINÆ.

Corizus maculatus, Fieb. .. .. Nagasaki.
,, *crassicornis*, Linn. .. .. Yokohama.

LYGÆIDÆ.

LYGÆINÆ.

Melanospilus elegans, n. s. .. .. Niigata.
Lygæus equestris, Linn. .. .. Junsai, Nagasaki.
Arocatus sericans, Stal. .. .. Kumamoto.
,, *melanostoma*, Scott. .. Kiga, Nagasaki.
Nysius plebeius, n. s. .. .. .. Yokohama.
,, *expressus*, n. s. .. .. Niigata.

CYMINÆ.

Ischnorhynchus nubilus, n. s. .. Yokohama.
Cymus aurescens, n. s. .. .. Chiuzenji.

BLISSINÆ.

Ischnodemus spinicaput, Scott. .. Yokohama.
,, *obnubilus*, n. s. .. .. Yokohama.
Chauliops fallax, Scott. .. .. Nagasaki, Seba.
Blissus pallipes, n. s. .. .. .. Yokohama, Niigata.
,, *bicoloripes*, n. s. .. .. Yokohama, Nagasaki.

GEOCORINÆ.

Geocoris varius, Uhler. .. .. Yokohama.
,, *proteus*, n. s. .. .. Yokohama, Nagasaki, Otsu, Niigata.

PACHYGRONTHINÆ

Pachygrontha antennata, Uhler. .. Yokohama, Nagasaki, Hitoyoshi, Kobè.

MYODOCHINÆ.

Prosomæus brunneus, Scott. .. .. Kobè.
Pamera ejuncida, n. s. .. .. Nagasaki.
„ *exigua*, n. s. .. .. .. Nagasaki.
„ *jejuna*, n. s. .. .. .. Kumamoto, Hosokutè.
„ *erubescens*, n. s. .. .. Yokohama.
„ *hemiptera*, Scott. .. .. Yokohama, Shibukawa.
„ *lateralis*, Scott. .. .. Yokohama, Nagasaki.
„ *rustica*, Scott. .. .. Nagasaki,
„ *festiva*, n. s. .. .. .. Sanjo.
„ *pallicornis*, Dall. .. .. Nagasaki.
„ *albomarginata*, Scott. .. Kashiwagi.
Plociomera japonica, n. s. .. .. Nagasaki.
Lasiosomus pallipes, Scott. .. .. Yokohama, Nagasaki.
Pachymerus japonicus, Stal. .. Yokohama, Nagasaki, Wada togè.
Tropistethus antennatus, Scott. .. Nagasaki.
Dieuches abbreviatus, Scott. .. Yokohama, Nagasaki.
„ *dissimilis*, n. s. .. .. Hakodatè, Ono.
Paradieuches lewisi, n. g. and s. .. Yokohama.
Pœantius lineatus, Stal. .. .. Nagasaki.
Gastrodes japonicus, Stal. .. .. Nagasaki.
Lethæus lewisi, n. s. .. .. .. Nagasaki.
Drymus marginatus, n. s. .. .. Ichiuchi.
Lamproplax membraneus, n. s. .. Yokohama, Nikkô, Nagasaki.
„ „ var. *pallescens*. Nagasaki.

PYRROCORIDÆ.

LARGINÆ.

Physopelta gutta, Burm. .. .. Ichiuchi, Hitoyoshi.

PYRRHOCORINÆ.

Pyrrhocoris tibialis, Stal. .. .. Nagasaki, Kumamoto, Kobè, Tagami.

Coptosoma cribraria, Fabr.

There appears to be a distinct race of this species in Japan. The typical Fabrician form is wide-ranging, and I have received it from Continental India, Malacca, and Formosa. In these habitats it does not vary, but possesses the usual pale colour, as is well shown in Herrich-Schäffer's figure. In Japan, however, it is constantly darker in hue, and on the average larger in size; the last a character, however, of little moment, and of frequent occurrence with other Japanese examples of common Palæarctic and Oriental species.

Geotomus punctulatus, Costa, var.

Cydnus punctulatus, Costa, 2e Cent. Napol. (1847), 30, 8, pl. 5, f. 11 ; Sign., Ann. Soc. Ent. Fr., 1883, p. 54, 25, Cyd., pl. xix., f. 164.

Dr. Signoret, to whom I submitted this species, returned it with the following remarks :—" *Geotomus* trés voisin du *punctulatus*, Costa, de l'Europe ; en diffère par un seul poil sur le rebord de la tête près des yeux, par l'absence de point piligère sur le côté des élytres, par le radiale n'atteignant pas l'extremité de la corie — du reste, même forme et même canal ostiolaire, voir fig. 160 Sign., planche 18 des Cydnides, ce qui le rapproche de *pygmæus*, Dall., fig. 160, et *Lethierryi*, fig. 159. Seulement le vôtre est plus obèse ; revoir avec le type *pygmæus*, Dall., qui me semble plus étroit, et en faire une espèce nouvelle, si vous les trouvez assez différent."

Having submitted all the *Cydninæ* which were at all doubtful to Dr. Signoret, who has recently made a profound and critical study of this subfamily, I here add his description of the following new species :—

Canthophorus variegatus, Sign.

" Long. 5 mill. ; larg. 3 m. fort. Coll. Distant.

" Ovalaire, d'un brun noir métallique, ponctué. Les bords latéraux du prothorax, le rostre en partie, le second article des antennes, les élytres en grand partie, surtout le côté externe et le cubitus, le pourtour de l'extrémité de l'écusson, les tibias moins le sommet, le sommet et la base de chaque segment ventral, 3 taches sur les côtés de l'abdomen, d'un jaune brun.

" La majeure partie des élytres est d'un jaune brun, avec deux macules noirâtres, une à la base de la corie entre le radiale et le cubitale, l'autre plus grande, au sommet, laquelle s'étend aussi sur l'espace marginal. Tête échancrée, le lobe médian plus court que les latéraux qui le dépassent, mais sans le réunir au-de-là ; ceux-ci légèrement réfléchis ; antennes avec le second article beaucoup plus court que le 3e, celui-ci trois fois plus long. Rostre atteignant les trochanters intermédiaires. Membrane brune, ne dépassant pas l'abdomen, avec des fortes nervures sinueuses. Poitrine ponctuée. Plaques mattes, grandes, ponctuées, et légèrement striées. Canal ostiolaire sans ouverture visible, et occupant les $\frac{3}{4}$ transverses du métasternum. Abdomen brun métallique, varié de plus clair, surtout à la base et au sommet de chaque segment.

"Cette espèce ne peut être confondue avec aucune autre ; en taille elle se rapproche du *Tritomegas bicolor*, en couleur du *Crocistethus Waltlii* ; mais par le canal ostiolaire sans ouverture ou fissure elle se distingue de tous les Sehirides.

"*Hab.* Sapporo."

Pœcilochroma lewisi, n. s. (Pl. XIX., fig. 1).

♂. Above bright emerald-green, thickly and darkly punctate, and with the following red markings: pronotum with the posterior margin continued in an arcuate discal fascia and connected with a central longitudinal fascia; scutellum with two central basal <-shaped fasciæ, two discal oblique fasciæ angularly connected at centre (the connection sometimes imperfect) and with a transverse subapical fascia, which is lineately widened at centre and continued along the apical margin. Body beneath with the head and sternum bright emerald-green; posterior margin of prosternum—broadly at angles—ochraceous; posterior margin of mesosternum, and whole area of odoriferous apertures, opaque silky fuscous; abdomen ochraceous, with a broad central and outwardly angulate greenish-black fascia; the anal appendage and a marginal segmental row of large pyriform spots of the same colour; legs and rostrum bright emerald-green. Antennæ black, finely pilose; 3rd, 4th, and 5th joints subequal in length; eyes more or less ochraceous, ocelli red. Besides the punctuation above, there is also a more or less irregularly distributed dark carinate reticulation.

♀. Larger and broader than the male; markings above similar, beneath with the legs ochraceous; lateral margins of the head, bases of acetabula, some lateral suffusions on sternum, upper apices of femora, and the tibiæ, more or less bright and pale shining greenish; anal appendage, a lateral row of segmental spots and a few central basal spots to abdomen, and apical portion of the rostrum, very dark greenish black. ♂, long. 16 mm.; exp. lat. angl. pronot., 10 mm. ♀, long. 19 mm.; exp. lat. angl. pronot., 11½ mm.

Hab. Nikko, Kashiwagi, Chiuzenji, Yokohama.

This species is nearest allied to the North-east Indian *P. interrupta*, Hope.

Neocazira, n. g.

Head long and obliquely deflexed, lateral lobes slightly longer than the central, rugose, with two central short obtuse conical spines. Pronotum rugose, with two discal obtuse conical spines, a shorter spine near centre of lateral margins, and the lateral angles prominently but obtusely spinous. Scutellum broad, deeply and concavely sinuate near base, and then convexly widened and dilated to apex, which is rounded and almost reaches the abdominal apex; gibbous and obtusely crenulate at base, with a raised tubercle at centre, the apical portion deflexed, and the apical margin obtusely crenulate. Connexivum obtusely crenulate. Anterior femora incrassated, crenulate, and armed with some prominent spines on under surface; anterior tibiæ broadly and concavely dilated, and armed near anterior margin with a distinct but somewhat obtuse spine; intermediate and posterior femora crenulate, armed with a prominent spine beneath near apex.

This genus is allied to *Cazira*, from which it is separated by the broader, longer, and posteriorly deflexed scutellum, &c.

Neocazira confragosa, n. s. (Pl. XIX., fig. 2).

Blackish, more or less covered with greyish pile. Antennæ dark castaneous, the apical joint ochraceous, with its base castaneous, 2nd joint a little shorter than the 3rd, 3rd and 4th subequal in length, the 4th and 5th distinctly incrassated. Head thickly covered with greyish pile; the eyes dark fuscous. Pronotum less pilose at centre, where there is a central longitudinal posteriorly widened darker area; all the spines darker, and particularly rugulose at base. Scutellum with the central longitudinal area somewhat non-pilose and darker, the raised central tubercle pale castaneous, behind which the deflexed area is fuscous. Corium somewhat thickly and palely pilose. Membrane fuscous. Anterior legs dark fuscous, some of the tubercles on the femora and tibiæ being obscure castaneous, the apices of the tarsal joints ochraceous. Intermediate and posterior femora dark fuscous, spotted with ochraceous, especially towards the apex; tibiæ dark fuscous, their apical halves ochraceous, more or less tinged with castaneous; tarsi fuscous, the bases of the 1st joint and apices of the 2nd and 3rd

luteous. Body beneath (carded specimen) greyish ochraceous, mottled with fuscous, with an abdominal marginal series of fuscous spots. Long. 6½ mm.; exp. pronot. angl., 4½ mm.

Hab. Yuyama.

Picromerus similis, n. s.

In colour, markings, and general appearance almost undistinguishable from *P. lewisi*, Scott, but structurally differing from that species by the lateral angles of the pronotum, which are less produced, more obtusely pointed, and distinctly curved backward at their apices, where they are slightly castaneous. Long. 12 mm.; exp. pronot. angl. 8 mm.

Hab. Hakodatè.

Graphosoma lineata, Linn.

The varietal form *G. nigrolineata*, Rossi, was alone brought home by Mr. Lewis, although the form *G. rubrolineata*, Hope, is also found in Japan.

Scotinophora horvathi, n. s. (Pl. XIX., fig. 3).

Scotinophora vermiculata, Horv. (nec Vollenh.), Term. füzetek., iii., p. 143, n. 12 (1879).

Differs from *S. vermiculata*, Voll. (an Indo-Malayan species), by the lateral lobes of the head being distinctly longer than the central, and thus causing a strongly cleft excavation at the apex of the head; the anterior angles of the pronotum are very long and robust, curved and directed forwards, their apices truncate, but armed with three small spines; antennæ black, the base of the 1st joint luteous. Long. 9 mm.; greatest abdom. width, 6 mm.

Hab. Yokohama.

Ænaria assimulans, n. s. (Pl. XIX., fig. 4).

Closely allied to *Æ. lewisi*, but more ochraceous in hue; antennæ with the 4th and 5th joints black, their apices luteous; pronotum with two small black spots on disk a little before anterior margin; scutellum with two small central black spots at base, and with two obscure lateral spots near apex.

This species structurally differs from *Æ. lewisi* in the following respects :—The anterior angles of the pronotum are more truncate and acute, and less rounded ; the base of the pronotum is not truncate, but slightly though distinctly concave ; and the scutellum is very different, the lateral margins being concavely narrowed nearly to the apex, and not abruptly sinuate a little beyond the middle, as in Scott's species. Long. 12—13 mm.

Hab. Nagasaki.

Palomena angulosa.

Cimex angulosus, Motsch., Etud., 10, p. 23 (1861).

This species varies from green—the prevalent and normal colour—to luteous above, thus approaching to *P. rubricornis*, Scott ; a species not contained in the collection, and which, judging from the description and the absence of any "differentia specifica," appears to have been separated by the red antennæ.

Sepontia ænea, n. s.

Above, dark bronzy-green ; anterior and lateral margins of the pronotum and three well separated spots at base of scutellum (the central largest), bright luteous ; basal disk of pronotum and some discal suffusions to scutellum ochraceous : antennæ ochraceous, 4th and 5th joints darker, sometimes pitchy ; eyes brownish ; body beneath bronzy-green ; lateral margins of sternum (widest at prosternum), and an abdominal marginal segmental row of spots (sometimes extending to sternum), luteous ; legs ochraceous ; the femora, and a basal and subapical annulation to tibiæ, bronzy-green. The head and pronotum are very thickly and coarsely punctate, the scutellum somewhat more finely punctate, especially near the base. Antennæ with the 2nd joint slightly shorter than the third, 4th longer than the 3rd, but shorter than the 5th. The body beneath is thickly and coarsely punctate. Long. 3½—4 mm. ; lat. 3—3½ mm.

Hab. Yuyama, Kumamoto.

This interesting genus was founded by Stål to contain two species, one from South Africa, the other received from Java and the Philippines ; from the last the Japanese species is very distinct, both in colour and also by the relative lengths of the 2nd and 3rd joints of the antennæ.

Stollia lewisi, n. s. (Pl. XIX., fig. 6).

Luteous, coarsely and darkly punctate. Head shining purplish-black, rugosely punctate; antennæ luteous, the 5th joint, excluding base, and apical half or two-thirds of the 4th, black. Pronotum with the lateral angles very prominent, subacute and black, their apices somewhat recurved and their bases obtusely notched behind, the lateral and anterior margins luteous and glabrous, the whole surface coarsely covered with black punctures, and with two foveate black spots near anterior margin. Scutellum not reaching the apex of corium, covered with coarse black punctures, the basal angles blackish and containing a large glabrous, raised, luteous spot, the apex with a central and two lateral small black spots. Corium coarsely black-punctate; membrane fuscous, the apical margin paler. Body beneath as above, the disk of the abdomen blackish, and its lateral margins narrowly luteous and glabrous, broken with black at the segmental incisures. Legs luteous, faintly spotted with black, the femora more distinctly spotted, apices of the tarsi black. Long. 6 mm.; exp. pronot. angl. 5 mm.

Hab. Awomori, Urasa and Seki, Niigata.

The acutely produced lateral angles of the pronotum give this species anything but a congeneric appearance, compared with other species of the genus *Stollia*, and rather superficially allies it with *Carbula*, from which the broad scutellum will at once separate it.

Alcimus borealis, n. s.

Luteous, thickly covered with coarse dark brown or blackish punctures. Head greenish black, coarsely punctate, with a small central spot near base, an oblique spot at inner margin of each eye, and two frontal longitudinal fasciæ on inner margin of lateral lobes, luteous. Antennæ black, the 1st joint testaceous, 3rd joint slightly longest. Pronotum with the anterior margin, a cruciform spot behind centre of same, and the anterior portion of lateral margins in front of pronotal processes, luteous and levigate; the anterior space between the luteous margins and the apices of the pronotal angular processes greenish black, the last being notched above, and then acutely produced and slightly directed backwards. Scutellum with a somewhat large levigate luteous spot near

each basal angle. Corium with a narrow oblique castaneous stripe near centre. Membrane fuscous. Body beneath (imperfectly examined owing to the specimen being carded) dark brownish and punctate, much irrorated with luteous markings, generally levigate, of which the most prominent are some central spots on sternum, two large contiguous spots on lateral margins of prosternum, and the central base of same, two transverse lineate spots on each side of mesosternum, an oblong submarginal spot, and two narrow marginal spots to metasternum with base of same, lateral margins of abdomen broken at incisures, and anterior and posterior segmental margins. Femora dark shining fuscous, their apices luteous; tibiæ luteous, striped with fuscous; tarsi black. Long. 8 mm.; exp. pronot. angular apices, 8 mm.; lat. at base of corium, $4\frac{1}{2}$ mm.

Hab. Nara.

This species is allied to *A. coronatus*, Stål, which was received from the Deccan, but differs from the description of that species by the colour of the antennæ, femora and lateral margins of the pronotum, the longitudinal fasciæ in front of the head, and also by its relative size, which in Stål's species, though agreeing in length, has a greater expanse at pronotal angles, and also an increased breadth of body. From *A. japonicus*, Scott, it differs by the luteous markings of the head and pronotum, &c.

Parastrachia, n. g.

Body elongate and ovate; head large, the lateral lobes longer than the central, not meeting in front, the lateral margins slightly ampliated and very strongly reflexed; antennæ with the basal joint passing the apex of the head; pronotum with the lateral margins reflexed, the anterior lateral margins ampliated, the anterior angles subacute, the posterior angles somewhat broadly rounded and subprominent; scutellum long, the lateral margins almost straight, the apex attenuated, the basal portion moderately gibbous, from which a central, longitudinal robust carination extends to near apex; corium with the lateral margins moderately convex; membrane passing the apex of the abdomen; rostrum passing the posterior coxæ; abdomen with a prominent central longitudinal ridge, but without a basal spine.

The position of this genus is somewhere between the genera *Strachia* and *Catacanthus*, with both of which it has affinities.

Parastrachia fulgens, n. s. (Pl. XIX., fig. 5).

Body above red; antennæ, eyes, base of head, centre of anterior margin and a large transverse discal spot to pronotum, scutellum, clavus, a large rounded discal spot to corium and membrane, black; apical margins, a central linear apical line and the apex of scutellum, and apex of clavus, red; apical margins of membrane pale fuscous or reddish; body beneath red; rostrum, legs, disk of sternum, large submarginal segmental spots and anal appendage to abdomen, black; the 2nd and 3rd joints of the antennæ are subequal in length, the 4th slightly longer than the 5th; the pronotum is somewhat obscurely punctate; the scutellum has the central base levigate, the basal lateral margins transversely striate, and the apical half distinctly punctate; corium thickly and somewhat coarsely punctate; tibiæ very strongly setose. Long. 16—18 mm.

Hab. Konosé, Yokohama.

Plautia fimbriata.

Cimex fimbriatus, Fabr., Mant., 2, p. 295, 162 (1787).
Plautia Stali, Scott, Ann. & Mag. Nat. Hist., Ser. 4, vol. 14, p. 11 (1874).

I quite agree with Horvath in considering Japanese specimens as conspecific with *P. fimbriata*, and can find no character sufficient to separate *P. Stali*. Japanese specimens are generally of a larger size, but this is quite a usual character with the Japanese examples of some of the common Palæarctic species.

Menida japonica, n. s. (Pl. XIX., fig. 7).

Pale obscure luteous, coarsely and darkly punctate; head greenish black, very thickly and coarsely punctate, with some obscure luteous lines on the ante-ocular area; antennæ dark fuscous, the 2nd joint and the bases of the remaining joints dull ochraceous; pronotum with the lateral and anterior margins narrowly luteous and glabrous, the lateral angles rounded and subprominent, the whole area coarsely and darkly punctate, the anterior

half with about seven black spots, two central and foveate near anterior margin, and five across disk (these last spots are inconstant in number), and a black spot at lateral angles; scutellum more sparingly and darkly punctate, a small black patch at basal angles containing a raised glabrous spot, two central black spots on anterior half (sometimes partly united) and two lateral black spots near apex, which is somewhat impunctate; corium coarsely and darkly punctate; membrane fuscous, the apical half pale hyaline; connexivum luteous, with black spots at the segmental incisures; body beneath luteous, punctured with black; legs luteous, apices of the femora, bases and apices of tibiæ, and tarsi (excluding base), blackish; the anterior angles of the pronotum are obtusely pointed; the 2nd and 3rd joints of the antennæ are subequal in length and a little shorter than the 4th and 5th, which are also subequal. Long. 8½ mm.; exp. pronot. angl. 5 mm.

Hab. Nagasaki.

Clinocoris gramineus, n. s. (Pl. XIX., fig. 8).

Bright yellowish green; head, anterior area of pronotum and scutellum, pale ochraceous; head sparingly and coarsely punctate; antennæ with the basal joint ochraceous, the 2nd and 3rd fuscous, 4th and 5th black, with their bases narrowly ochraceous, 2nd joint a little shorter than the 3rd, 4th a little longer than the 5th; pronotum coarsely and darkly punctate, the lateral angles produced into long, slightly raised and recurved, shining black spines, which have a distinct central carination; scutellum coarsely and darkly punctate, the apex impunctate; corium thickly and coarsely punctate, somewhat paler at base; membrane fuscous, exhibiting a distinct broad central dark fascia; body beneath and legs ochraceous; rostrum with the apex pitchy, and reaching the base of the abdominal spine, which just extends beyond the intermediate coxæ; mesosternal process reaching or just passing the anterior coxæ; the body beneath is impunctate, with the exception of a series of coarse black punctures along the anterior margin of the prosternum. Long. 10—12 mm.; exp. pronot. angl. 7½—8 mm.

Hab. Chiuzenji.

Urostylis striicornis, Scott.

Taking the species to be represented by a portion of the diagnosis, *viz.*, 1st joint of the antennæ with a fuscous streak exteriorly, the colour certainly varies from ochraceous to greenish. I consider the species to be variable within the limits of the superficial characters given for the three described forms, *U. striicornis*, *U. annulicornis*, and *U. westwoodii*, Scott. The describer, however, states that he has found structural characters in the genital segments to separate his species; and though not questioning his decision, as I have not the material for verification, I am still dubious whether dried specimens afford sufficient material for separating species on the character of the last genital segment having "an external spoon-shaped process," as compared with being "broad, flat, slightly dilated at the apex," or on the contrary "aculeate," especially when the species are practically indistinguishable in other respects.

Megymenum tauriformis, n. s.

Very dark fuscous, with bronzy reflections; antennæ with the 2nd and 3rd joints non-dilated, but somewhat flattened and channelled, the 3rd and 4th about equal in length, the last reddish ochraceous, with the base fuscous; head with two distinct conical spines on the lateral margins a little in front of the eyes, the posterior spine minute; pronotum with an anteriorly produced conically dentate angulation on the anterior lateral margins at a little distance from the eyes, lateral margins truncate, with a short central spine, their anterior angles truncate, their posterior angles rounded, the disk uneven and crenulate, with a distinct rounded callosity near centre of anterior margin; scutellum of ordinary structure, and as in *M. subpurpurascens*, Hope; membrane pale obscure ochraceous, the whole disk darker and sometimes fuscous; margins of the abdomen broadly and obtusely dentate; legs concolorous, tarsi somewhat castaneous. Long. 13½—15 mm.; greatest pronot. exp. 7—7½ mm.

Hab. Kashiwagi, Nara.

The structural characters of the non-dilated 2nd and 3rd joints of the antennæ, with the 3rd and 4th joints of equal length, assign to this species a position in the subgenus *Pissistes*, Stal; whilst the curved and *anteriorly* directed

spines near the anterior angles of the pronotum render it very distinct.

Dr. Horvath, in his paper previously referred to, has enumerated the *Megymenum spinosum*, Burm., amongst his Japanese identifications, a course in which he was subsequently followed by Mr. Scott.

The above species is very distinct from *M. spinosum*, being in fact divided by subgeneric characters; and is the only one now brought home by Mr. Lewis.

Melanospilus elegans, n. s. (Pl. XIX., fig. 9).

Pale reddish; head, antennæ, two large central spots to pronotum, which are narrowed anteriorly and almost attain to the anterior and posterior margins, scutellum, clavus (excluding apex), a large irregular discal spot to corium, which outwardly does not reach the costal margin, membrane (excluding basal angle and apical margin), head beneath (excluding central line), a lateral spot to prosternum, anterior area of mesosternum, which is macular at lateral margin, lateral margins of metasternum, central lateral spots to abdomen, abdominal apex, coxæ, legs, and rostrum, black; basal angle and apical margins of membrane whitish. The head, antennæ, and legs are finely pilose, the central carinations of the pronotum and scutellum are very pronounced, and the corium is strongly concavely sinuate at base. Long. 9—10 mm.

Hab. Niigata.

This species differs from the description of *L. cruciger*, Motsch., by the colour of the scutellum, the absence of the spots described as "hemelytrorum quatuor cruciforme dispositis," by the presence of the central spots to the abdomen, &c. It is distinguished from *M. fimbriatus*, Dall., by the colour of the head, the apex of the clavus, and the abdomen beneath.

In his List of the Japanese Rhynchota, Mr. Scott (Ann. & Mag. Nat. Hist., ser. 4, vol. xiv. (1874)), includes in the family *Lygæidæ* a "*Melanocephalus cruciger*, Motsch.," and in the family *Pyrrhocoridæ* a "*Melanospilus cruciger*, Motsch." The first of these generic names must evidently be a misprint, whilst the second as clearly belongs to the *Lygæidæ*, and both evidently refer to the same species described by

Motschulsky as *L. cruciger* from the Amur. I doubt very much whether this species occurs in Japan, and incline to the opinion that the species here described is the one to which Mr. Scott's reference was made.

Nysius plebeius, n. s.

Head, pronotum, and scutellum, pitchy ochraceous, very coarsely punctate; head with the apex and central base distinctly paler; antennæ ochraceous, apices of 1st and 2nd joints infuscated, 2nd joint largest, 3rd and 4th subequal in length; eyes pale fuscous; pronotum with a central carinate line, a central spot at base and lateral angles paler, the last preceded by darker coloration, a faint transverse dark constriction before middle; scutellum with a distinct central dark carination, the basal margin also excavated and darker; corium very pale and semitransparent ochraceous, with two linear discal longitudinal series of spots, apex and a central spot on apical margin, and a few irregular spots on apical half of clavus, brownish; membrane pale hyaline, slightly tinged with ochraceous on disk; body beneath pitchy; posterior margins of pro-, meso-, and metasternums, coxæ, and legs, ochraceous; femora spotted with fuscous; apical joint of tarsi and the rostrum fuscous. Long. 4 mm.

Hab. Yokohama.

Nysius expressus, n. s.

Ochraceous; head with the eyes and a somewhat oblique fascia on each side extending from about base of antennæ to base of head, fuscous; antennæ brownish ochraceous; pronotum with two narrow transverse black constrictions near anterior margin, each connected therewith by two fuscous fasciæ; remaining portion with a few scattered dark punctures, with a central pale levigate line and the lateral angles brownish; scutellum fuscous and coarsely punctate; corium with two linear brown spots on apical margin, one at apex and the other about centre; membrane pale hyaline, through which the dark abdomen beneath is reflected; body beneath ochraceous, submarginal fasciæ to sternum and abdomen broadly fuscous, the last inwardly containing a series of small pale spots, and the former a large pale spot at metasternum, base of abdomen fuscous (owing to the

typical and unique specimen being carded, I am unable to fully describe the under surface of the body); coxæ and legs ochraceous; femora suffused and spotted with brownish; apices of the tibiæ, bases of the intermediate and posterior tibiæ, and apices of the tarsal joints, fuscous; antennæ with the 2nd joint longest, the 3rd and 4th subequal in length. Long. 4 mm.

Hab. Niigata.

Ischnorhynchus nubilus, n. s.

Head black, finely pilose; eyes and a basal spot brownish; antennæ black, the 2nd joint annulated with brownish near centre, and apex of 4th joint narrowly of the same colour; pronotum brownish ochraceous, sparingly but coarsely punctate, with an impressed transverse black fascia near anterior margin, and with some clusters of dark punctures forming four irregular brownish spots on posterior margin; posterior angles narrowly of the same colour; scutellum black, more or less covered with greyish pile, coarsely punctate, with a central brownish tubercular spot; corium brownish ochraceous, with a large irregular transverse fuscous spot at inner angle, containing a small testaceous spot at apical margin, which is also fuscous; above the fuscous spot, at outer margin of clavus, is a large pale olivaceous impunctate spot, and the apical 3rd is somewhat testaceous, the clavus is longitudinally and coarsely punctate, and the corium is coarsely punctate along the disk, the costal and claval margins being impunctate; membrane pale hyaline, the body beneath reflected at base; femora black, with their apices castaneous; anterior and intermediate tibiæ obscure castaneous, with their bases black; posterior tibiæ and the tarsi dark castaneous or fuscous; body beneath black, anterior margin of prosternum, coxæ, and posterior margin of metasternum ochraceous, prosternal lateral angles brownish. Long. 4 mm.

Hab. Yokohama.

Cymus aurescens, n. s. (Pl. XIX., fig. 10).

Bright shining ochraceous; apical joint of the antennæ, excluding base, a small spot at claval apex, a short discal longitudinal streak on corium (absent in a second

specimen), extreme apex of corium, and tarsal apices, black; eyes and basal joint of antennæ pale castaneous; scutellum pale castaneous, with a central longitudinal impunctate luteous fascia; outer margin of clavus pale castaneous; membrane pale smoky hyaline, with some black spots near base, and a curved pale brownish fascia near centre; body beneath somewhat darker (carded specimen); femora, excluding apices, tibial apices and tarsi, brownish. The basal joint of the antennæ does not quite reach the apex of the head, and is barely half the length of the 2nd, 2nd and 3rd subequal, 4th much shorter than 3rd; the head is obscurely punctate; pronotum coarsely punctate, the extreme posterior margin impunctate; scutellum punctate on basal and lateral margins; clavus sparingly punctate, coarsely so on outer margins; corium thickly punctate, the costal margin broadly and palely impunctate. Long. 4 mm.

Hab. Yokohama, Chiuzenji.

In general size and structure this species is allied to the European *C. glandicolor*, Hahn; from the North Indian *C. tabidus*, described by Stål, it differs by the basal joint of the antennæ not reaching the apex of the head.

Ischnodemus obnubilus, n. s. (Pl. XIX., fig. 11).

Body pilose. Head and pronotum black; eyes and lateral angles of pronotum castaneous. Antennæ black; apices of the 2nd and 3rd joints narrowly and indistinctly castaneous. Scutellum black. Corium ochraceous, with its apical 3rd piceous. Membrane either pale fuscous with the base narrowly greyish white, or altogether of the last colour, and only reaching the penultimate segment of the abdomen. Abdomen above piceous, the connexivum ochraceous. Body beneath and legs black; the femoral apices, tibiæ, and tarsi ochraceous, tinged with piceous, the tarsi palest; lateral margins of the abdomen narrowly castaneous. The basal area of the pronotum is finely transversely striate and somewhat non-pilose, margined posteriorly by a transverse carinate line, in front of which are two discal incised lines, which are anteriorly reflected and bent at right angles. Long. 5 mm.

Hab. Yokohama.

Blissus pallipes, n. s.

Head and pronotum black, somewhat shining; antennæ with the 1st and 2nd joints castaneous, the 3rd and 4th fuscous; eyes dark castaneous; scutellum black, opaque; corium very pale ochraceous, the apical angles broadly black, and a subclaval brownish oblique line on each side; costal margin narrowly ochraceous; clavus with about the basal half black, the outer margin ochraceous; membrane greyish white, the veins brownish; body beneath piceous; legs reddish ochraceous. The body both above and beneath is finely pilose; the membrane does not quite reach the penultimate segment of the abdomen, which is piceous and finely pilose. Long. 5 mm.

Hab. Niigata, Yokohama.

Blissus bicoloripes, n. s. (Pl. XIX., fig. 12).

Head, pronotum, and scutellum, black; antennæ piceous; corium pale stramineous; basal half and extreme apex of clavus, and apical area of corium, from which extend two short discal streaks, more or less black; membrane pale olivaceous-brown, the veins darker; abdomen above and body beneath black; femora and tibiæ piceous, their bases and apices ochraceous; tarsi ochraceous. The body is finely pilose; head and pronotum coarsely punctate; membrane neither reaching the apex nor lateral margins of the abdomen; anterior femora unarmed. Long. $3\frac{1}{2}$ mm.

Hab. Nagasaki, Yokohama.

This species appears to be allied to *B. gibbus*, Fabr., an Indian species, from the *description* of which it differs by its smaller size, different colour of the legs, and the scutellum not "dense punctatum," &c.

Geocoris proteus, n. s. (Pl. XX., figs. 1, 2).

Head black; eyes castaneous; antennæ black, the 4th joint, the apex of the 3rd, and sometimes the apex of the second joint, brownish ochraceous; pronotum black, very coarsely punctate, the lateral angles ochraceous, and with two very distinct transverse foveæ a little before centre; scutellum black, coarsely punctate;

corium dark olivaceous-brown, the lateral margins ochraceous, the apical 3rd and the clavus distinctly punctate; membrane greyish, tinged with pale olivaceous; body beneath, rostrum and femora black; coxæ, femoral apices, tibiæ and tarsi, ochraceous. The membrane does not quite reach the apex of the abdomen, which is black.

Var. Corium with the base and claval margin, as well as the lateral margin, ochraceous; the posterior angles of the metasternum also ochraceous. Long. 3 mm.

Hab. Nagasaki, Yokohama, Niigata, Otsu.

Pamera ejuncida, n. s. (Pl. XX., fig. 3).

Body linear and elongate; head and anterior lobe of pronotum black, the collar of the last brownish; posterior pronotal lobe ochraceous, sparingly but deeply punctate, brownish anteriorly, with a central piceous line, which does not reach posterior margin, and the lateral angles luteous and impunctate; scutellum castaneous, with either the basal half black and a central black line, or with a large central basal spot, the basal half of lateral margins, and a central line, black, apex luteous; corium pale ochraceous, sparingly punctured with brownish, the lateral margins pale and impunctate, a black spot near centre of apical margin, attached to which are some linear black punctures more or less enclosing a subtriangular pale spot at claval apex; clavus thickly and longitudinally brown punctured; membrane greyish white; head beneath and sternum piceous; abdomen castaneous, somewhat piceous at base, and with a few transverse stigmatal piceous spots; antennæ and legs ochraceous, the last with the tarsal apices black, the coxæ castaneous. The head is long and somewhat prominently exserted; the anterior lobe of the pronotum is distinctly longer than the posterior, the hind margin of which is prominently concave. Long. $7\frac{1}{2}$ mm.

Hab. Nagasaki.

This and the two following-described species appertain to Stål's first section of the genus, and have their affinity with *P. longula*, Dall., an American species.

Pamera exigua, n. s.

Closely allied to the preceding species, but differing by the shorter and less elongate anterior lobe of the pronotum, the apical joint of the antennæ distinctly infuscated, the whole of the body beneath uniformly piceous, and all the femora, excluding apices, more or less pitchy; the membrane is also pale fuscous, with the veins greyish. Long. 7 mm.

Hab. Nagasaki.

Pamera jejuna, n. s.

Head, anterior lobe of pronotum and scutellum, black, opaque, and more or less obscurely pilose; antennæ pale castaneous; basal and apical joints fuscous, with their bases sometimes distinctly paler; anterior collar of pronotum brownish; posterior pronotal lobe ochraceous, punctate, with three broad longitudinal brownish fasciæ, of which the central is darkest, and with a brown spot at lateral angles; scutellum transversely and coarsely punctate, with a central longitudinal carination; corium pale ochraceous, sparingly punctured with brown, the lateral margins pale and impunctate; at inner apical angle near apex of clavus a series of black punctures enclose a greyish impunctate spot; these black punctures are confluent and macular anteriorly and posteriorly; clavus thickly and longitudinally covered with piceous punctures; membrane pale olivaceous-brown, the veins greyish; body beneath piceous and finely pilose; femora shining piceous, with their bases and apices luteous; tibiæ and tarsi luteous, the tarsal apices dark piceous. Long. $7\frac{1}{2}$ mm.

Hab. Hosokuté, Kumamoto.

This species differs from *P. exigua* by the longer and more attenuated anterior lobe of the pronotum; and from *P. ejuncida* by the different colour of the antennæ, scutellum, and legs.

Pamera erubescens, n. s.

Head, pronotum, and scutellum black, the first shining with a somewhat greenish tint, and the second opaque, sometimes with the posterior lobe more or less brownish; antennæ dull, obscure, ochraceous, the apices of the 1st,

2nd, and 3rd, and the whole of the 4th joint, fuscous; corium brownish ochraceous, thickly and darkly punctate, the costal margin from base to near apex and the extreme apex luteous; membrane dark fuscous, the veins paler, with a central apical paler triangular spot, and a small luteous spot at apex of corium; head and sternum beneath black; abdomen testaceous, with the basal disk blackish, and a few lateral dark stigmatal spots; legs ochraceous, the anterior femora generally broadly annulated with fuscous near apex, apices of the intermediate and posterior femora also sometimes infuscated, tarsal apices fuscous; rostrum ochraceous, with the base and apex somewhat pitchy. The head is finely but distinctly pilose, the posterior lobe of the pronotum distinctly punctate, the scutellum possesses some scattered coarse punctures and a central apical carination, the clavus is longitudinally punctate, and the corium punctate and somewhat distinctly pilose. The body is somewhat broad and ovate; the anterior femora strongly spined beneath on their apical halves. Long. 5 mm.

Hab. Yokohama.

This species, judging from Stål's description, would seem to be allied to *P. sinæ* of that author, a Chinese species, and one recorded from Japan by Dr. Horvath. The one here described is, however, a smaller insect, and without the "vitta prope commisuram apiceque corii nigro-fuscis" of Stål's diagnosis.

Pamera rustica.

Diplonotus rusticus, Scott, Ann. & Mag. Nat. Hist., ser. 4, vol. xiv. (1874).

Dr. Horvath has recorded *Pamera nietneri*, Dohrn, as collected by Xantus in Nagasaki, without mentioning the above species described by Mr. Scott. It is of course possible that they are synonyms, but I am unable at present to decide. Stål gives Ceylon, Java, and the Philippines as localities from whence he has received Dr. Dohrn's species, which thus coincides with the distribution of *P. pallicornis*, Dall., which we know is found in Japan.

Pamera festiva, n. s.

Head and scutellum black; eyes brownish; antennæ luteous, with the apical joint fuscous; pronotum with the anterior lobe reddish brown, the anterior collar ochraceous; the posterior lobe ochraceous, coarsely and darkly punctate, its lateral margins and angles luteous and impunctate, with a small brownish subangular spot, and the disk with three broad reddish-brown fasciæ; scutellum with a few scattered punctures near base, the apical half carinate and more coarsely punctate; clavus and corium luteous, the inner margin and apex of the clavus darkly punctate; corium with scattered dark punctures, a small obscure blackish spot near base, some macular series of black punctures near inner apex, which extend transversely to near costal margin, and an irregular subapical black spot, these enclosing a pale and almost impunctate spot, and with the extreme apex dark ochraceous; membrane pale olivaceous, with some darker markings; head beneath and sternum piceous; abdomen testaceous, with the basal disk piceous and some lateral stigmatal dark spots; legs ochraceous, anterior femora, excluding apices, pale testaceous, tarsal apices fuscous. The body is somewhat elongate, the head distinctly pilose, the anterior femora armed beneath on the apical halves with some long slender spines. Long. 6 mm.

Hab. Sanjo.

This species is allied to *P. annulicornis*, Dall.

Pamera pallicornis.

Rhyparochromus pallicornis, Dall., List. Hem., 2, p. 573, n. 37 (1852).

Plociomerus discoguttatus, Dohrn, Stett. Ent. Zeit., xxi., p. 404, n. 58 (1860).

Diplonotus luridus, Scott, Ann. & Mag. Nat. Hist., ser. 4, vol. xiv. (1874).

Pamera pallicornis, Horv., Term. füzetek., iii., p. 147, n. 47 (1879).

There can be no doubt as to the identity of this widely-spread and well-marked species. It was originally described by Mr. Dallas from Continental India; and again by Dr. Dohrn from Ceylon, as detected by Stal, who

received the species from the Philippines. I have also received it from North Borneo, where it was collected by Mr. Pryer; and, as these specimens do not differ from those brought home by Mr. Lewis, I have added Mr. Scott's proposed name to the synonymy.

Hab. Nagasaki.

Plociomera japonica, n. s.

Head fuscous and pilose; antennæ ochraceous, 1st joint, excluding base and the apical joint, fuscous; pronotum with the anterior lobe fuscous, sometimes with the collar ochraceous, and sometimes wholly brownish; posterior lobe ochraceous, with five indistinct brownish fasciæ; scutellum dark brownish, the apex luteous; corium ochraceous, sparingly and darkly punctate, margins levigate, costal margin with two dark brown spots, one near middle and one at apex, a large triangular greyish white opaque spot near inner angle, at apex of which is a brown spot, and another small spot of the same colour near base of corium; membrane ochraceous, with longitudinal but curved and waved brown fasciæ; body beneath brownish or fuscous; legs ochraceous; apices of the femora, base of the tibiæ, and apical joint of the tarsi, fuscous. Antennæ with the 2nd joint largest, the 3rd and 4th subequal; pronotum with the anterior lobe slightly rugulose, the posterior lobe distinctly punctate; scutellum punctate, the punctures on apical portion larger but more scattered, the apical central carination distinct. Long. $3\frac{1}{2}$—$4\frac{1}{2}$ mm.

Hab. Nagasaki.

Pachymerus japonicus.

Pachymerus (*Graptopeltus*) *japonicus*, Stal, En. Hem., iv., p. 160, n. 3 (1874).

Graptopelta albomarginata, Scott (nec. Uhler), Ann. & Mag. Nat Hist., ser. 4, vol. xiv. (1874).

From specimens identified as *G. albomarginata*, Uhler, by Mr. Scott, and given to me by Mr. Lewis, I have satisfied myself as to the necessity of the above synonymy. As described by Mr. Uhler, his species reaches 11 mm. in length, and I have as yet seen nothing like it from Japan.

P. japonicus, as pointed out by Stål, is very—and, one might add, extremely—closely allied to *P. adspersus*,

Muls., but differs by the colour of the 1st joint of the antennæ and by the punctuation of the lateral margins of the pronotum. I possess a specimen of *P. adspersus* from the Amur, and find the above differences to be valid and distinct, thus affording further evidence to the experience which I have already acquired, and showing that, as a rule, Rhynchota from the Amur are distinct, though closely allied to those of Japan. The females are considerably larger and generally darker in colour than the males: the species altogether varies towards melanism, and the series recently brought home by Mr. Lewis are considerably darker than those he procured on his previous journey.

Mr. Lewis' localities are Nagasaki, Yokohama, Wada togè.

Dieuches dissimilis, n. s.

Head and pronotum black; lateral margins of pronotum (excluding extreme base and apex) luteous, castaneous before the lateral angles, which are black; antennæ with the 1st and 2nd joints ochraceous, the 3rd and 4th fuscous; eyes dark fuscous; scutellum black; corium luteous, apical margin and inner angle broadly castaneous, with an irregular elongate black spot (widest anteriorly) on apical claval margin, and two black costal spots beyond centre; membrane fuscous, paler at base and apex; body beneath black; legs reddish ochraceous. Head, pronotum, and scutellum coarsely but obsoletely punctate, clavus with three longitudinal series of punctures, corium with a distinct submarginal series of punctures curved inwardly towards apex, and preceded by a short discal series and an apical submarginal series. Long. 5 mm.

Hab. Ono, Hakodatè.

This species is rather aberrant to the generic character of *Dieuches*, by having the anterior femora somewhat incrassated. In general structure it is allied to *D. armipes*, Fabr.

Paradieuches, n. g.

Allied to *Dieuches* (section *D. armipes*, Fabr.), but with the anterior femora strongly incrassated and distinctly spined beneath near apex; pronotum with the anterior margins convex, transversely constricted a little behind the middle, before which the anterior area is

subglobose, the lateral margins dilated but not extending to apical margin, which is alone as wide as the head; posterior margin concavely sinuated before the scutellum.

This genus appears to be somewhat intermediate between *Dieuches* and *Neurocladus*.

Paradieuches lewisi, n. s. (Pl. XX., fig. 4).

Head black, with the apex brownish; antennæ with the 1st and 2nd joints brownish ochraceous, the 3rd and 4th black, with their bases brownish ochraceous; pronotum black, the posterior lobe somewhat purplish, the dilated margins luteous, except at lateral angles, where they are purplish black; scutellum black; clavus purplish, with a longitudinal paler streak on each side near apex; corium with the basal third luteous, the remainder purplish, with two black costal spots near centre (between which the colour is luteous), a similar spot near centre of claval margin, and the apex broadly black; corial apical and the posterior half of claval margin black; basal angle narrowly black; membrane black, the base and apical margin narrowly brownish ochraceous, with a large white spot on each side near apex of corium; body beneath black; legs castaneous, the femora with their apices very narrowly black. The posterior lobe of the pronotum has a distinct central foveate impression; the scutellum is somewhat gibbous; the clavus longitudinally punctate; and the disk of the corium is sparingly punctate. The pronotum has the posterior lobe thickly but obsoletely punctate, and the anterior lobe somewhat pilose. Long. 6 mm.

Hab. Yokohama.

Pœantius lineatus.

Pœantius lineatus, Stål, En. Hem., iv., p. 162, n. 2 (1874).

The type specimens, male and female, of this species were received from the Philippines; but, judging from the description of the same, I have little doubt that I have correctly identified the Japanese specimen collected by Mr. Lewis.

Only two species of this genus are at present described, one from South Africa and the other apparently common to the Philippines and Japan.

Gastrodes japonicus.

P. (*Platygaster*) *japonicus*, Stål, En. Hem., iv., p. 164, n. 1 (1874).

Platygaster ferrugineus, Scott (nec Linn.), Ann. & Mag. Nat. Hist., ser. 4, vol. xiv. (1874).

Lethæus lewisi, n. s. (Pl. XX., fig. 7).

Head black, the base impunctate, and from the ocular area somewhat finely punctate, apex of central lobe castaneous; antennæ with the 1st joint black, its base narrowly ochraceous; 2nd joint brownish ochraceous, its apex black; 3rd joint black, its base narrowly brownish ochraceous, and its apex broadly luteous; 4th joint black, its apex very narrowly brownish; pronotum black, with the anterior area glabrous and shining, the posterior area rugulosely punctate; lateral margins (broadest at posterior angles) ochraceous; scutellum black, coarsely punctate; corium piceous, coarsely punctate, lateral margins ochraceous and impunctate, an obscure transverse greyish streak near apex and a short ochraceous line near claval apex; membrane pale fuscous; body beneath black; femora black, with their apices narrowly castaneous; tibiæ and tarsi ochraceous; rostrum ochraceous, its tip piceous. Long. $7\frac{1}{2}$ mm.

Hab. Nagasaki.

This species is allied to the *L. indicus*, Dall., from Bengal; but the colour of the antennæ and of the lateral margins of the pronotum will alone distinguish it.

Drymus marginatus, n. s. (Pl. XX., fig. 6).

Body above black, lateral margins of the corium narrowly obscure castaneous; head and anterior area of the pronotum thickly and finely punctate; posterior pronotal area, scutellum, and corium thickly and coarsely punctate; membrane very pale olivaceous; body beneath and legs black, tarsi brownish; antennæ black, apex of the 4th joint narrowly brownish. Long. $4\frac{1}{2}$ mm.

Hab. Ichiuchi.

Lamproplax membraneus, n. s. (Pl. XX., fig. 5).

Head, pronotum, and scutellum black; pronotum with an oblong spot at lateral angles, and sometimes with the centre of basal margin ochraceous; corium brownish

ochraceous, the costal margin broadly ochraceous (narrowest at base); membrane pale hyaline, with an olivaceous tinge; body beneath black, the abdomen sometimes somewhat castaneous towards apex; legs pitchy castaneous, the tarsi more or less ochraceous; antennæ with the 1st joint castaneous, its base and apex narrowly ochraceous; 2nd joint black, with its extreme base and apex a little paler; 3rd pitchy, with the apex ochraceous; 4th castaneous, its apex paler (in a second specimen all the joints are castaneous). The pronotum has the reflexed lateral margins somewhat ochraceous, its anterior area somewhat gibbous and shining, the posterior area strongly and rugosely punctate, and with a few scattered punctures at lateral and anterior margins; scutellum coarsely punctate, the disk rugulose; clavus and corium coarsely and longitudinally punctate; sternum coarsely punctate; posterior and intermediate tibiæ strongly setose; anterior femora with two slender spines beneath near apex. Long. 4½—5 mm.

Hab. Yokohama, Nikko, Nagasaki.

Var. *pallescens.*

Differing from typical forms of the species by its smaller size, and by the 1st joint of the antennæ and legs being entirely ochraceous; abdomen beneath castaneous. Long. 4 mm.

Hab. Nagasaki.

A single specimen of this variety was brought home by Mr. Lewis, in which I can find no structural characters to specifically separate it from the species I have described above.

Ectrychotes delibutus, n. s. (Pl. XX., fig. 12).

Head, antennæ, anterior lobe of pronotum, scutellum, body beneath, and legs, black; posterior lobe of pronotum red, with the incisures black, and in some specimens the whole disk is pitchy; corium black, with the lateral margins broadly reddish, widened at base, and either attenuated or in some specimens slightly broadened at apex; membrane black; connexivum above and beneath black, with subquadrate red spots at segmental incisures; in the female its apex is black; abdomen beneath with a central segmental row of transverse red spots, which in

some specimens amalgamate with the marginal spots at apex; tarsi pitchy brown; antennæ strongly setose. Long. 8½—9 mm.

Hab. Kumamoto.

Labidocoris splendens, n. s. (Pl. XX., fig. 8).

Coral-red, shining; antennæ, eyes, corium (excluding lateral margins, which are slightly widened at base and triangularly amplified at apex), membrane, sternum, coxæ, a submarginal segmental row of large spots to the abdomen and disk of anal appendage to same, basal annulation to the femora, apices of the tibiæ, and tarsi (excluding base and claws), black; antennæ with the 1st, 2nd, and 3rd joints prominently setose, the extreme base of the 1st joint red, anterior femora armed beneath near apex with a prominent and robust spine. Long. 14 mm.

Hab. Yokohama.

This specimen is labelled "Old fig 'God tree,' Japan."

Labidocoris insignis, n. s. (Pl. XX., fig. 9).

Black; posterior lobe of pronotum, lateral margins of corium (widened at base and somewhat triangularly amplified at apex), connexivum, and abdomen above and beneath, coral-red and shining; disk of anal appendage black; coxæ, extreme bases and apices of femora, and tarsi, ochraceous and somewhat pitchy. As in the preceding species, the first three joints of the antennæ are strongly setose, and the anterior femora are armed beneath near apex with a prominent and robust spine. Long. 11—12 mm.

Hab. Kobé.

Hæmatoloecha rubescens, n. s. (Pl. XX., fig. 11).

Allied to *H. nigro-rufa*, Stål,* but differing in the following particulars:—The head is red, with the eyes black; the pronotum is not marked with black at the incisions; the scutellum is red; corium red, with a large black spot occupying clavus and adjacent part of corium, as in *H. nigro-rufa*, but with the apex also broadly black; legs red, anterior femora with a broad

* Plate XX., fig. 10.

obscure fuscous annulation at base, intermediate and posterior femora with a darker central annulation, tibiæ, excluding base, fuscous, tarsi ochraceous, the apices fuscous; head beneath and prosternum red; meso- and metasternums black, with the coxæ red; abdomen red, with broad transverse black fasciæ at the segmental incisures; rostrum red. The lateral carinæ of the scutellum are more raised, and the basal central excavation somewhat less broad than in Stal's species. Long., male and female, 12—13 mm.

Hab. Nagasaki.

Explanation of Plates.

PLATE XIX.

Fig. 1. *Pœcilochroma lewisi.*
2. *Neocazira confragosa.*
3. *Scotinophora horvathi.*
4. *Ænaria assimulans.*
5. *Parastrachia fulgens.*
6. *Stollia lewisi.*
7. *Menida japonica.*
8. *Clinocoris gramineus.*
9. *Melanospilus elegans.*
10. *Cymus aurescens.*
11. *Ischnodemus obnubilus.*
12. *Blissus bicoloripes.*

PLATE XX.

1. *Geocoris proteus.*
2. ,, ,, var.
3. *Pamera ejuncida.*
4. *Paradieuches lewisi.*
5. *Lamproplax membraneus.*
6. *Drymus marginatus.*
7. *Lethæus lewisi.*
8. *Labidocoris splendens.*
9. ,, *insignis.*
10. *Hæmatoloecha nigro-rufa*, Stal.
11. ,, *rubescens.*
12. *Ectrychotes delibutus.*

XXI. Ægognathus Waterhousei, *a new genus and species of* Dorcidæ *from Peru.* By Franz Leuthner, Ph.D.

[Read November 7th, 1883.]

Plate XXI.

Ægognathus, n. g.

Similar in appearance to *Ægus*, but is most allied to *Lissotes* and *Alcimus*.

♂. Body flat. Head flat, quadrangular, much broader than long, the anterior frontal margin a little emarginate, without epistoma, straight at the sides. Eyes rather large, open; canthus of the same oblique; the swelling in the cheek behind this rounded, not prominent. Mentum broad and short; gula strongly convex. Prothorax broader than the head, broadest in front, narrowed towards the posterior angles; the anterior angles acute; the posterior angles rounded off, and in continuation of the flexuous line of the posterior margin. Prosternal process flat, acuminate. Elytra longer than the head and prothorax together, narrower than the prothorax, straight at the shoulders, with pointed humeral angles; flat. Femora of the posterior legs inflated in the middle. Tibiæ of the intermediate and posterior legs unarmed.

Ægognathus Waterhousei, n. s. (Pl. XXI., fig. 3).

♂. Entirely black, upper side dull, under side shining. Mandibles as long as the head and prothorax together, their appearance calling to mind *Ægus*; strongly bent inwards, terminating in a blunt point, in the middle with a strong upward directed acuminate tooth, which, when the mandibles are closed, does not reach the corresponding tooth of the other mandible; at the base with three small approximate teeth perpendicularly arranged. Head and prothorax dull. Elytra reticulate-punctate, the punctures forming irregular lines; black, with a bluish bloom (as in *Sclerostomus*

mandibularis and *Lessonii* from Chili); with extremely fine pubescence. Tibiæ of the anterior pair of legs with four unequal teeth on the apical half of the outer edge.

Measurements, ♂:—Total, 30 mm.; head, 4·5 long, 9·5 broad; mandibles, 9·5; prothorax, 5·5 by 10; elytra, 12 by 9.

♀. Unknown.

Hab. Peru (Chanchamayo). Collected by Mr. Tham. British Museum.

I have much pleasure in dedicating this very interesting species to my friend Mr. C. O. Waterhouse, the well-known entomologist, as a slight acknowledgment of the great assistance which I have constantly received from him while occupied in studying the collections of *Lucanidæ* in the British Museum.

Although this insect resembles *Ægus* in its general appearance, and especially in the shape of the mandibles, yet it cannot be properly referred to *Ægus*, or to any other allied genus; and I have therefore found myself compelled to establish a new genus for its reception. It is intermediate in character between *Ægus* and *Alcimus*, and likewise exhibits some relationship with the South American genus *Sclerostomus*.

The *Ægidæ* have their metropolis in the Sunda Islands, and extend northwards to Malacca on the one side and to China and Japan on the other, and they have likewise been received from Celebes, New Guinea, and the Fiji Islands; while *Alcimus* occurs in the Navigators Islands also, thus bridging over part of the distance towards the west coast of South America.

If we consider the relationship existing between the Australian and New Zealand fauna and that of South America,* we cannot be surprised if we meet with fresh proofs of affinity between Indo-Australian and American forms as often as collections are received from previously unexplored countries or localities.

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* This is shown by the Venezuelan genus *Sphenognathus*, which is most nearly allied to the Australian genus *Cacostomus*, and by the South American genera *Chiasognathus* and *Streptocerus*, which clearly resemble the Australian genus *Lamprima*; and by the affinity of the Brazilian genus *Hexaphyllum*, Gray, to the Australian genus *Syndesus*; as well as by the occurrence of Marsupials and Cassowaries in America and Australia.

XXII. *Description of a new species of* Eurytrachelus (Coleoptera, Dorcidæ). By Chas. O. Waterhouse.

[Read November 7th, 1883.]

Plate XXI.

Eurytrachelus pilosipes, n. s. (Pl. XXI., fig. 1).

Niger, depressus, subopacus; mandibulis capite duplo longioribus, ad medium dente sat magna acutiuscula armatis, ultra medium denticulis 3 vel 4, et intra apicem dente parvo instructis; tibiis posticis inermibus, ad apicem fulvo-pilosis, tarsis subtus longe fulvo-pilosis. Long. corp. 18 lin., mandib. 8 lin.

Black, tinted with pitchy colour below. Head and thorax densely and finely granulose; the elytra coriaceous; altogether more finely sculptured than *E. concolor*. Head twice as broad as long, with the sides parallel. Epistoma rather broad, about one-quarter of the width of the head immediately in front of the eyes; arcuately emarginate in front; the angles rather acute, but not very prominent. Mandibles as in *E. concolor*, not carinate above, but gently convex; strongly curved, and acuminate at the apex. At the middle there is a moderately large, rather acute, tooth; immediately beyond this (nearer the apex) there are three (or four) small teeth placed close together: this part of the mandible, when viewed from the under side, appears like a dilation of the mandible, and is more opaque than the rest of the surface, the apex of the teeth shining: at a short distance from the apex there is another small tooth. Thorax as in *E. concolor*. Elytra as long as the head and thorax together (including the epistoma); much less narrowed towards the apex than in *E. concolor*, and more obtuse at the apex. Prosternum between the anterior coxæ rather broader than in *E. concolor*, sloping down posteriorly, with no tendency to form a projection. Abdomen with the middle portion of the margins of the segments beset with short yellowish hairs; and at the apex of the terminal segment there is

a small tuft of hair. The long fulvous hair at the apex of the posterior tibiæ forms a sort of brush; that on the posterior tarsi, which gives them such a peculiar appearance, not only covers the under side, but borders the apical margin of the upper side.

Hab. Santa Anna Island, Soloman Islands.

Two examples collected by H. B. Guppy, Esq., and now presented to the British Museum.

This species, having the four posterior tibiæ not furnished with a spine on the outer side, must be placed near *E. concolor*, Blanch., and *E. ternatensis*, Thoms., but it differs from both these in having the tarsi fringed with long fulvous hair. Dr. Gestro has described and figured another species, *E. intermedius* (Ann. Mus. Civ. Stor. Nat. di Genova, xvi., p. 317), from New Guinea and Kei Island, which has the same peculiarity in the tarsi, but that species is described as blackish castaneous, with a narrow deeply emarginate clypeus, and is represented as having much shorter elytra.

In the British Museum collection there is a single specimen from Duke of York Island, which differs from *E. pilosipes* in the form of the head and mandibles, and may possibly belong to a distinct species. I prefer, however, to consider it at present a variety of *E. intermedius*. (Pl. XXI., fig. 2).

Explanation of Plate XXI.

Fig. 1. *Eurytrachelus pilosipes*, Waterhouse.
2. ,, *intermedius*, Gestro, var. ?
3. *Ægognathus Waterhousei*, Leuthner.
[*Ægopsis* on plate.]

PROCEEDINGS

OF THE

ENTOMOLOGICAL SOCIETY OF LONDON

For the Year 1883.

February 7, 1883.

J. W. Dunning, Esq., M.A., F.L.S., &c., President, in the chair.

Mr. Dunning returned thanks to the Members for his election to the office of President, and nominated Messrs. Stainton, Godman, and M'Lachlan as Vice-Presidents for the ensuing year.

Donations to the Library were announced, and thanks voted to the respective donors.

Election of Members.

Philip Crowley, Esq. (Waddon House, Croydon), and Capt. George Ernest Shelley (13, Rutland Gate, W.), were balloted for and elected Members of the Society. A. C. Horner, Esq. (Tonbridge, Kent), was elected an Annual Subscriber.

Exhibitions, &c.

Mr. T. R. Billups exhibited a species of *Conocephalus*, which was taken in a greenhouse at Lee, Kent, on August 18th, 1882. It was kept alive until within ten days of the meeting, feeding on flies, spiders, pieces of meat, &c., showing a decided preference for house flies. In August, 1881, a similar specimen was taken in the same greenhouse, but their origin could not be traced.

Mr. J. Jenner Weir believed this to be the same species as the specimens he exhibited last year (Proc. Ent. Soc. Lond., 1882, p. xxi); he remarked that in the matter of food his specimens certainly preferred spiders. Referring to the predaceous habits of this species, Mr. Weir mentioned that in Palestine Mr. Tristram had observed large locusts preying on the herbivorous locusts.

Mr. F. P. Pascoe read the following:—

"The Duke of Argyle, in a letter to 'Nature' of December 7th, dated from Cannes (Nov. 29), records a most remarkable instance of mimicry in a moth. He describes it as 'a very handsome species, with an elaborate pattern of light and dark chocolate-brown. But the margins of the wings, which were deeply waved or dentated, had a lustrous yellow colour, like a brilliant gleam of light.' Some movement 'gave it alarm.' 'It then turned slightly round, gave a violent jerk to its wings, and instantly became invisible.' The Duke on further examination found that these 'splendid margins of the fore wings . . . had to be concealed; and so, by an effort that required the exertion of special muscles, these margins were folded down—covered up—and hidden out of sight. The remainder of the wings were so crumpled up that they imitated exactly the dried and withered leaves around.' It will be observed that the writer speaks of 'special muscles,' but a special adaptation of the nervures in the way of joints would also be necessary. It is unfortunate that the moth was not secured. Mr. Butler has, he tells me, no idea of the species. The Duke is an observer, otherwise there might be thought to be some error in the description of what really took place."

Mr. M'Lachlan and Mr. Stainton made some remarks thereon, the former considering that either *Phlogophora meticulosa* or *Calocampa vetusta* was the moth alluded to. Mr. Stainton thought it probable that *Macroglossa stellatarum* was referred to; he incidentally remarked that he could hardly believe it possible that there were no butterflies at Cannes in November, as stated in the Duke's letter.

Mr. E. A. Fitch exhibited a specimen of *Rhynchium parentissimum*, Sauss., taken at Ambarawa, Java, by Ludeking. In a recent memoir on the *Eumenidæ* of the Indian Archipelago, published in the Ann. Soc. Ent. France for 1882, M. Maindron had considered this species to be a variety of *R. hæmorrhoïdale*, Sauss. (*l. c.* pp. 277—280); from a study of his second plate (*l. c.*, pl. iv.) this appeared impossible, but Mr. Fitch pointed out that the exterior recurrent nervure of the fore wing was present in the specimen exhibited, and was doubtless erroneously omitted in the otherwise beautiful figure (Ann. Soc. Ent. Fr., 6th ser., vol. ii., pl. 4). A variety of *Eumenes circinalis*, Fabr., and *Vespa*, n. s.?, were also exhibited from the same locality.

Paper read.

Mr. Louis Péringuey communicated "Notes on three *Paussi*," giving an interesting account of the habits of *P. lineatus*, Thnbg., *P. Linnei*, Westw., and *P. Burmeisteri*, Westw., as observed at the Cape of Good Hope, and in many specimens kept for some time in confinement.

Mr. W. F. Kirby referred to Capt. Boyes' paper in the Journ. As. Soc. Beng., ser. 2, vol. i. (1843), reprinted in Ann. & Mag. Nat. Hist., vol. xvii., pp. 88—91, giving an account of some Indian *Paussi;* Mr. Kirby suggested that the ants might find some protection from their enemies in having the *Paussus* with his available artillery in their nest.

New Part of 'Transactions.'

Parts IV. & V. of the 'Transactions' for 1882 was on the table.

March 7, 1883.

J. W. Dunning, Esq., M.A., F.L.S., &c., President, in the chair.

Donations to the Library were announced, and thanks voted to the respective donors.

Election of Members.

Francis Ford Freeman, Esq. (8, Leigham Terrace, Plymouth), Frederick Charles Lemann, Esq. (Blackfriars House, Plymouth), and Frederick W. Smith, Esq (Hollywood House, Blackheath Point, Blackheath, Kent), were balloted for and elected Members of the Society.

Exhibitions, &c.

Mr. R. M'Lachlan exhibited a specimen of *Polistes hebræus*, Fabr., which was captured in one of the London Docks on Saturday last; the specimen was in a dormant state, but revived from the heat of the meeting-room. These wasps had been commonly seen on a ship returning from Calcutta, which contained a quantity of bamboos as dunnage; Mr. M'Lachlan thought these probably contained nests of the *Polistes*.

Mr. T. R. Billups exhibited specimens of *Phœogenes homochlorus*, Wesm., and *Hemiteles incisus*, Brdg., captured at Chobham last summer.

Mr. Billups also exhibited a further specimen of the Orthopteron exhibited at last meeting, and which he had identified as *Copiophora cornuta*, DeG., a Central American species.

Dr. D. Sharp exhibited a preparation showing the pro- and meso-thoracic membrane of a large *Elater* (*Chalcolepidius porcatus*, Linn.), in which the prothoracic breathing orifices were of a hitherto unobserved structure. The two stigmata were closed by hinged, horny trap-doors, very similar in action to the lid of a trap-door spider's nest. Dr. Sharp observed that this membrane was of especial interest, not only for its novelty, but for its functional or teleological importance which is, he believed, to guard against attacks from minute parasitic *Acaridea;* when the *Elater* was stretched on its back (in the position preliminary to springing) the stigmatic orifices

would be open, and, except for the presence of these "trap-doors," it would be easy for any acarideous parasite to establish itself in the entrances of the tracheæ.

The Secretary exhibited, on behalf of Mr. G. S. Saunders, a microscopic instrument which greatly facilitated the examination of pinned or living specimens under the microscope without alteration of the stage. The instrument, which was made by Messrs. Baker & Sons, 243, High Holborn, consists of a double plate of ebonite in which is fixed a brass ball which is made to rotate by working a handle fixed at the side of the plate; the ball is hollow, and can be either filled with cork for pinned specimens, fitted as a small "live box," or made to hold a small pair of forceps.

Paper read.

Mr. J. B. Bridgman communicated a paper entitled "Further Additions to Mr. Marshall's Catalogue of British Ichneumonidæ," in which sixteen species were referred to as new to Britain, and twenty-six species described as new to science.

New Part of 'Transactions.'

Part I. of the 'Transactions' for 1883 was on the table.

April 4, 1883.

J. W. Dunning, Esq., M.A., F.L.S., &c., President, in the chair.

Donations to the Library were announced, and thanks voted to the respective donors.

The President announced the sudden death, on March 27th last, of Prof. P. C. Zeller, of Stettin, who had been an Honorary Member of this Society for upwards of thirty years, suitably alluding to his life and works in some extended remarks. Messrs. Stainton, M'Lachlan, and Westwood also communicated some reminiscences of our late colleague.

Election of Members.

Lewis F. Hill, Esq. (3, Edwardes Terrace, Kensington), and Louis Peringuey, Esq. (Rondebosch, Cape Town), were balloted for and elected Members of the Society.

Exhibitions, &c.

Mr. W. F. Kirby exhibited specimens of *Acridium succinctum*, Linn., received from Mr. T. Davidson, who stated that it was this species of locust which had lately been causing great destruction in the Deccan and other parts of India.

Prof. Westwood called attention to a communication to a Sussex newspaper by a gardener named Page, stating that he had found a new cause of

the potato disease. On examination by Prof. Westwood, this supposed cause was found to consist in the attacks of *Polydesmus complanatus*, L. After Guérin-Meneville's and Curtis's publications on the numerous insects, myriapods, &c., which are found living in the diseased potatoes, he was surprised that the now well-known potato disease should be attributed to these attacks.

The Rev. A. E. Eaton exhibited a patent revolving object-holder, used by mineralogists, affording very great facilities in adjusting the position of insects subjected to microscopical examination, thus allowing of the examination of every part without removing the specimen. In the place of forceps or fixed cork for the attachment of objects, this holder has at the extremity of the arm a perforated cylinder that is made to rotate by means of a chain movement connected with a milled wheel at the opposite end of the arm. To adapt them for entomological work the holders on sale require a hinge or cradle-joint to be made in the stem just above the swivel, to work in the direction of the length of the arm: this is preferable to a ball and socket-joint. The perforation in the cylinder was filled with cork to receive the specimen pin.

Sir Sidney Saunders stated that his attention had been called to a typographical error, which had escaped notice in the recently-published part of our 'Transactions' for 1883, by the omission of the word "*tarsis*" (p. 9, line 7), although obviously implied by the context in the definition "*5-articulatis.*" Some further details of the fore tibiæ, as exhibited in Pl. II., fig. 23, should likewise have been inserted here, by the addition of "*apice latis, utrinque in dentes validos, latere externo tres latere interno duos, productis.*"

Sir Sidney Saunders also proposed to characterise the vegetable-feeding fig-insects as follows:—

"Sycophagides.—*Larvæ* intra ficum e germinibus educata. *Mares* apteri, ut adhuc cogniti. *Fœminæ* alatæ, capite fossula longitudinali dorsali, antennis prope fossulæ introitum insertis, intra quam retrorsum vertentibus incolumes servantur, articulis ultimis 3, 4, vel 5, clavam plus minusve laxam formantibus; abdomine longiore quam lato; terebra flexili, exserta, arcuata.

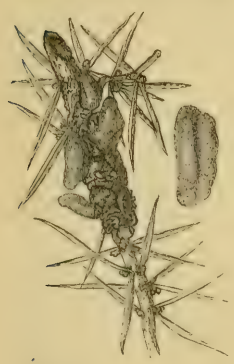
"Divisio 1. Prionostomata.—*Mares* mandibulis parvis; abdominis segmentis basalibus inflatis, reliquis tenuibus, retractilibus, sæpe subtus recurvis (rarius supra dorsum reflexis—*Sycocrypta*, Coq.). *Fœminæ* mandibulis appendice exarticulata, latere interno serrata, ad basin affixa; antennis articulo 3tio vel 4to in spinam validam acutam externe producto, articulum sequentem oblique prope basin accipiente.

"Divisio 2. Haplostomata.—*Mares*, a paucis speciebus characteres desumpti, elongati, angusti, depressi, mandibulis maximis, abdominis lateribus rectis, segmentis laxis, extimo late truncato, plerumque ut videtur

appendice flexili, multiarticulata, utrinque instructo (licet nonnullis hæ appendices desunt—*Apocrypta perplexa*, Coq.). *Fœminæ* mandibulis antennisque simplicibus.

"The aforesaid *Sycophagides*, together with their near allies the gall-feeders (*Cecidophagides*), as characterised by Linnæus in his 'Systema Naturæ' (6th edit. 1748), and by Fabricius in his 'Systema Piezatorum' (pp. 143, 146), appertaining alike to the *Phytiphaga*, the aphidivorous and other parasitic *Cynipidæ* not comprised under that category would constitute an osculant group (*Heterophagides*) leading to the *Entomophaga*, as already suggested, including those addicted to other propensities, as cited by Latreille ('*Figites, nonnulli saltem, excrementis humanis delectantur*,' Gen. Crus. et Ins., iv., p. 19)."

Mr. E. A. Fitch exhibited leaf-rosette galls of *Cecidomyia violæ*, F. Löw, found in Epping Forest on Sept. 23rd last by Mr. Henry Corder on *Viola sylvatica*. Dr. Löw described the gnat as new in 1881 (Verh. z.-b. Ges. Wien, xxx. 34), from specimens bred from similarly formed galls on *Viola tricolor*. Mr. Fitch also exhibited a bright red bean-like Aphis gall on a pinna of *Pistacia Lentiscus* from Cannes, received from Dr. Cobbold; its maker is probably *Aploneura lentisci*, Licht.? (*cf.* Ann. Soc. Esp. Hist. Nat., vii. 471–4). A curious new cecidomyideous gall on the woody twigs of *Juniperus* was also exhibited. Mr. Fitch had received specimens two days previously from Mr. W. C. Boyd from Mentone; the galls were very succulent, and greatly resembled a cluster of full-fed *Ixodes* or miniature brown leather pouches attached round the juniper twig, the bunch consisting of galls extending to the length of an inch along the twig; the galls were easily detached from the twig at their bases, and the orange-red gnat larvæ liberated, hence they probably undergo their metamorphoses in the ground.



Mr. H. Goss exhibited specimens of *Pimelia angulata*, Fabr., obtained by Mr. H. B. Forman in the temple of the Sphinx, near the Pyramids of Ghizeh, Egypt.

Papers read.

Mr. A. S. Olliff read a memoir "On a small collection of Clavicorn Coleoptera from North Borneo"; the specimens were collected by Mr. W. B. Pryer, and consisted of twenty-one species, twelve of which were described as new to science.

Mr. P. Cameron communicated some "Descriptions of new Genera and Species of Hymenoptera." These included nine species from the Sandwich Islands collected by the Rev. T. Blackburn, who has now left the locality;

four species from Britain, and a new genus and species of *Oxyura* from Brazil.

Mr. W. F. Kirby read some "Notes on new or little-known Species of Hymenoptera, chiefly from New Zealand." Eight species, belonging to various families, were characterized as new.

May 2, 1883.

J. W. Dunning, Esq., M.A., F.L.S., &c., President, in the chair.

The President read the following:—

Gentlemen,

Before proceeding to the important business of the evening, I crave your indulgence whilst I make a few preliminary remarks. You scarcely need to be reminded that we this day complete the fiftieth year of our existence. It was on the 3rd May, 1833, that nine gentlemen—Messrs. Children, J. E. Gray, G. R. Gray, Hope, Horsfield, Rudd, Stephens, Vigors, and Yarrell—met and resolved to found the Entomological Society of London. No time was lost; for on the 22nd of the same month the first General Meeting was held at the Thatched House Tavern, the Rev. Wm. Kirby was chosen Honorary President, 103 Members were enrolled, and a Council of thirteen were chosen to complete the organization of the Society and prepare Rules for its government. Rooms were taken at No. 17, Old Bond Street, and on the 4th November, 1833, under the Presidency of Mr. Children, the then Secretary of the Royal Society, a Code of Bye-Laws was adopted, and our first Scientific Meeting was held.

Of the Original Members, six, and six only, still survive—Prof. C. C. Babington, the Rev. Leonard Jenyns (now Blomefield), Sir Sidney S. Saunders, Mr. W. B. Spence, Mr. G. R. Waterhouse, and Prof. Westwood. Of these Mr. Waterhouse has the additional distinction of having been one of the original Council, and the first Curator of the Society.

Our meetings continued to be held at 17, Old Bond Street from 1833 until 1852, when we removed to No. 12, Bedford Row; during nine sessions commencing in 1866, by the kindness of the Linnean Society, we assembled in Burlington House, but our Library remained at Bedford Row. In 1875 the Library and place of meeting were again united in this house; and though the building operations now in progress have prevented us from indulging in any celebration of our Jubilee, we shall soon be in the enjoyment of improved accommodation, and I hope it may be long before the Society has again to change its quarters.

The Bye-Laws have been from time to time revised—in 1834, 1838, 1847, 1848, 1851, 1855, 1862, 1864 and 1876; but, in the main, the

original rules still govern us. In 1838 the class of Corresponding Members was instituted; in 1848 Annual Subscribers were allowed; and in 1851 the grade of Associates was introduced. The last-mentioned class was abolished in 1855; and you are to-night to be invited to consider the propriety of reverting to the original constitution, by prohibiting the future election of either Corresponding Members or Annual Subscribers, and leaving those classes to gradual extinction, or, as it is hoped, to absorption among the Ordinary Members.

At the present moment we have 33 Subscribers and 205 Ordinary Members, making a total of 238 contributing Members. Three years ago I ventured to express from this chair a hope that we might be able to publish a Jubilee List of not less than 300 Members. It is not yet too late. And I appeal to each and all of you, Gentlemen, to be active in striving to attain this object.

"The Entomological Society of London is instituted for the improvement and diffusion of Entomological Science." From first to last, this has been our only object. To bring fellow-workers into friendly communication and facilitate the interchange of ideas, to extract the hidden knowledge of secluded students, to provide a Library for consultation, to encourage observation and experiment, and to publish the results for the benefit of all whom they may concern—such is our aim, the very reason of our being. And I venture to assert that the Society has succeeded in its object. If any be inclined to doubt, I refer him to the thirty volumes of our Transactions, to the Record of Proceedings at our more than 600 meetings, as proof of our activity and of the unfailing ardour with which the Society has now for half a century devoted itself to the diffusion of entomological science.

Let me recall the names of some who in their day were enrolled in our ranks—such men, for instance, as Adams, Allis, Atkinson, Bainbridge, Bakewell, Bedell, Bell, Bevan, Bladon, Bowerbank, Bree, Brown, Champion, Children, Clark, Crotch, Curtis, Darwin, Dawson, Desvignes, the Doubledays, Evans, Gould, the Grays, Guyon, Haliday, Hewitson, Hope, Horsfield, Howitt, Ingall, Ingpen, Jesse, Kirby, Lee, Macleay, Melly, Murray, Newman, Newport, Pickering, Raddon, Roget, Saunders, Shuckard, Smith, Solly, Spence, Spry, Stephens, Swanzy, Swainson, Sykes, Thwaites, Turner, Vigors, Wailes, Walker, Walton, White, Wollaston, and Yarrell.

I might have added others to this list of departed worthies, and I am prohibited, by the fact that they are still amongst us, from mentioning many distinguished men; but the names I have recited, including students and workers in Entomology who have left their mark behind them, and others who happily were not limited to our own or even to kindred branches of Science, are sufficient to cast no light burden upon us and our successors to maintain the traditions of this Society. Is it nothing that we should stand in the place of such predecessors? Is it nothing that this Society

should have formed a bond of union and friendship between them? Surely an Association like this fulfils a useful purpose if it does nothing more than perform the humble function of the string that binds the pearls together.

At the outset it was part of the plan of operations that a Collection of Insects should be formed; and in 1835 the Rev. Wm. Kirby presented his entire collection of entomological objects to the Society, unfettered by any restriction whatever. It was found, however, that the formation and maintenance of a General Entomological Museum were more than the resources of the Society would warrant; and in 1855 the Exotic Collection was discontinued. Eventually, after thirty years' experience, the formation of a British Collection was also abandoned; the Kirbyan cabinets, and all the type-specimens, found a permanent home in the British Museum; and the Curator of the Society was merged in the Librarian.

Of the nine gentlemen who have filled the office of Curator or Librarian,—Messrs. Waterhouse, Pickering, Shuckard, Westwood, Bainbridge, Frederick Smith, Janson, T. A. Marshall, and Grut,—Mr. Smith occupied it for fourteen and Mr. Janson for twenty years; the present occupant is only in his sixth year of office, but it must be the wish and hope of all that he will continue to give us the benefit of his services for many years to come.

Of Treasurers we have had but six—Messrs. Hope, Yarrell, Samuel Stevens, M'Lachlan, J. Jenner Weir, and Edward Saunders. Of these Mr. Yarrell acted for eighteen and Mr. Stevens for twenty years. I trust the present Treasurer will grow as old in office as the oldest of his predecessors.

Originally there was but one Secretary, and the first was George Robert Gray; but at the beginning of 1834 he gave place to Mr. Westwood, and although Mr. W. B. Spence was for two or three years appointed Foreign Secretary, it was not until 1847 that two Secretaries were authorized by the Bye-Laws, and Mr. Westwood was provided with a colleague. The subsequent occupants of the office have been Messrs. Evans, Edward Doubleday, Douglas, Stainton, Wing, Shepherd, Janson, Dunning, Sharp, M'Lachlan, Grut, Verrall, Butler, Meldola, Distant, Fitch, and Kirby; so that by a curious coincidence the Society has during fifty years had just as many Secretaries as it has had Presidents.

Including our Honorary President, who died in 1850 at the patriarchal age of ninety-two, I have had twenty predecessors in this chair. It has throughout been one of our rules that the officers shall be elected annually, and that the President shall not hold that office for more than two years consecutively. Messrs. Children, Stephens, Newport, Spence, G. R. Waterhouse, Newman, J. E. Gray, Douglas, F. Smith, Pascoe, A. R. Wallace, Sir S. S. Saunders, and Stainton have each held it for two consecutive years; Mr. Curtis for one year; Mr. Bates for three; Mr. W. Wilson Saunders and Sir John Lubbock for four; the Rev. F. W. Hope and Prof. Westwood

each for six years. Nine of the twenty are still amongst us, and I am pleased to see that several of them are present this evening.

Gentlemen, I can only regret that, by the irony of fate, it has fallen to *my* lot to fill the Presidential Chair on this occasion, when, of all others, it ought to have been occupied by one of the Fathers of British Entomology. But you have willed it otherwise, and I will bury my regret; nay, it is already swallowed up in the delight I feel at the commission with which I have been entrusted by the unanimous voice of the Council, and I am sure that the proposition I have now to make will meet with your approval, and be carried by acclamation.

I have to suggest that Prof. Westwood be made titular Life-President of the Society.

There is no man to whom we as a body owe so much. An Original Member, he has never failed us; during the crucial period of our childhood he was the motive power, the life and soul of the Society; for fourteen consecutive years he was Secretary, and for part of that time he was Curator also. The Council has seldom been complete without him; he has been Vice-President times without number, and during six years (1851–52, 72–73, 76–77) he was our President. Whilst he resided in or near London he rarely missed one of our meetings; even Oxford cannot keep him away from us; and there is not a single year from first to last that he has not been a contributor to our 'Transactions.' From 1827 to the present time his pen and his pencil have never been idle; his papers are scattered broadcast over the scientific publications of this and other countries; and to single out a few of his more important works it is enough to mention the 'Introduction to the Modern Classification of Insects' (1839–40), the 'Arcana Entomologica' (1841–45), the 'Cabinet of Oriental Entomology' (1848), the 'Genera of Diurnal Lepidoptera' (1852), and the 'Thesaurus Entomologicus Oxoniensis' (1874). What do we not owe to Westwood's 'Introduction'? has it not been to many of the present generation of entomologists the very fountain and sole source of their scientific views? His labours have ranged over the whole domain of our Science. Specialists may excel in their own particular groups, but as a general entomologist have we a man to compare with him?

Scientific bodies, both at home and abroad, have delighted to do him honour: the Entomological Societies of France and Holland, of Berlin, Stettin, and St. Petersburg have claimed him for their Honorary List: other Scientific Associations in France, Germany and Austria, in Russia and Scandinavia, in the United States of North America and the Dominion of Canada, have vied with each other in conferring upon him such distinctions as lay in their power; Brazil has made him a Knight of the Imperial Order of the Rose; and if scientific knighthood carried any outward sign, his breast would be one blaze of stars.

At the foundation of the Society the joint authors of the 'Introduction to Entomology' were chosen Honorary Members. It was at the same time made one of our Bye-Laws that no other resident in the United Kingdom should be an Honorary Member; wisely, as I think, we have retained that Bye-Law, and I hope we shall retain it. The proposition to be submitted to you involves no infraction of that rule.

But, in addition to the Honorary Membership which he shared with Spence, the venerable Kirby was made Honorary President for life. And it occurred to our Secretary who bears that honoured name that it would be a graceful act to confer a similar distinction upon Professor Westwood. As Kirby's position was unique in 1833, so is Westwood's now: and it needs no Bye-Law to forbid a recurrence of to-night. The laws of Nature will prevent it; for long before our second Jubilee the Original Members will be no more.

I do not propose to abdicate the functions with which your kindness has invested me. But if it be your pleasure to adopt the suggestion that has been made, I shall be proud to recognise Prof. Westwood as my titular Chief, and to yield the Chair to him at any of our Scientific Meetings when we are favoured with his presence. I know no better way of showing that our constancy is equal to his, and that our gratitude is enduring and life-long. It is a barren title and an empty honour, but it is all that we as a Society can bestow. He has grown grey in our service, and in recognition of his services, to us in particular and to our Science in general, I ask you to confer upon him a title which will be a standing record of the esteem in which we hold him, and which throughout the evening of his days shall assure him of our affectionate respect.

The Honorary Life-Presidency.

The proposal was carried by acclamation, and Professor Westwood was declared Honorary Life-President of the Society.

Special Meeting.

A Special Meeting having been duly convened, pursuant to a requisition presented to the President and Council, for the consideration of certain proposed alterations in the Bye-Laws, which had been read at the three preceding meetings of the Society,—

Mr. E. A. Fitch proposed, and Mr. Pascoe seconded, that the Annual Contribution for a Member be raised from One Guinea to Two Guineas, and that Chapter 13 of the Bye-Laws be altered accordingly. The meeting was addressed by Messrs. Sheppard, Distant, M'Lachlan, Stainton, Kirby, Grut, C. O. Waterhouse, Lloyd, Edward Saunders, and Sir Sidney Saunders; and by Mr. Fitch in reply. The proposal was negatived by 19 to 5. A proposal to abolish the Admission Fee was withdrawn.

Mr. Grut proposed, and Sir Sidney Saunders seconded, that no more Annual Subscribers should be elected, and that Chapter 2 of the Bye-Laws should be altered by adding thereto the words, "But no Subscriber shall hereafter be elected." The meeting was addressed by Mr. Kirby and Mr. Fitch; and the proposal was carried by 23 to 2. The proposed consequential alterations in Chapters 12 and 15 were likewise carried.

Mr. W. F. Kirby proposed, and Mr. C. O. Waterhouse seconded, that no more Corresponding Members should be elected, and that Chapter 2 of the Bye-Laws should be altered by striking out the words "Corresponding Members." The meeting was addressed by Mr. J. Jenner Weir, Sir Sidney Saunders, Messrs. Fitch and Stainton; and the proposal was carried by 15 to 3. The proposed consequential alteration in Chapter 16 was likewise carried.

Mr. E. Saunders proposed, and Mr. Alfred Lloyd seconded, that every Member who has paid the Annual Contribution for the year shall be entitled to a copy of the 'Transactions' published during the year, and that Chapters 15 and 21 of the Bye-Laws be altered accordingly. The meeting was addressed by Messrs. Salvin, Stainton, Waterhouse, Weir, Kirby, Distant, and Sir Sidney Saunders; and the proposal was carried by 25 to 3.

Mr. M'Lachlan proposed, and Mr. C. O. Waterhouse seconded, that the mode of election of the Council and Officers be altered by requiring notice to be given of Candidates proposed to be substituted for any of the Members recommended by the Council, and that Chapter 20 of the Bye-Laws and the Schedule thereto be altered accordingly. The meeting was addressed by Mr. Jenner Weir, Mr. Wormald, and Sir Sidney Saunders; and the proposal was carried by 16 to none.

The result was that the proposed alterations in Chapters 8 and 13 were not carried; and that all the proposed alterations in Chapters 2, 12, 15, 16, 20 and 21 were carried.

Ordinary Meeting.

The minutes of the previous meeting were read and confirmed.

Donations to the Library were announced, and thanks voted to the respective donors.

Election of Members.

E. A. Butler, Esq., B.A., B.Sc. (Arnold House, University School, Hastings), and W. H. Miles, Esq. (33, Paris Street, Palace Road, Lambeth, S.E.) were balloted for and elected Members of the Society.

In consequence of the lateness of the hour all scientific business was postponed to the next meeting.

BYE-LAWS

OF THE

ENTOMOLOGICAL SOCIETY OF LONDON,

AS AMENDED

AT A SPECIAL MEETING HELD ON THE 2ND MAY, 1883.

CHAP. I. *Object.*

THE ENTOMOLOGICAL SOCIETY OF LONDON is instituted for the inprovement and diffusion of Entomological Science.

CHAP. II. *Constitution.*

The Society shall consist of Honorary Members, Foreign Members, Ordinary Members, and Annual Subscribers. But no Subscriber shall hereafter be elected.

CHAP. III. *Management.*

The affairs of the Society shall be conducted by a Council consisting of thirteen Members, to be chosen annually, four of whom shall not be re-eligible for the following year. Five shall be a quorum.

CHAP. IV. *Officers.*

The Officers of the Society shall consist of a President; three Vice-Presidents; a Treasurer; two Secretaries; and a Librarian. The Officers shall be chosen annually from amongst the Members of the Council. No Member shall be President, or a Vice-President, more than two years successively.

CHAP. V. *Removal or Resignation of Officers.*

1. For any cause which shall appear sufficient to a majority thereof the Council shall have power to suspend any Officer of the Society from the exercise of his office, or to remove him and declare such office vacant.

2. In the event of any vacancy occurring in the Council or Officers of the Society, at the next meeting of Council after such vacancy has been made known, the Council shall recommend to the Society the name of some person duly qualified to be elected to the vacant situation; and the next Ordinary Meeting of the Society shall be made a Special Meeting and the Members summoned accordingly, and the Election shall take place as provided for at the Annual Meeting, Chap. XX.

Chap. VI. *President.*

1. The duty of the President shall be to preside at the Meetings of the Society and Council, and regulate all the discussions and proceedings therein, and to execute or see to the execution of the Bye-laws and orders of the Society.

2. In case of an equality of Votes the President shall have a double or casting Vote.

Chap. VII. *Vice-Presidents.*

1. The Vice-Presidents shall be nominated by the President. Such nomination shall be declared at the Ordinary Meeting next after the election of the President in every year.

2. In the absence of the President a Vice-President shall fill his place, and shall for the time being have all the authority, power, and privilege of the President.

3. In the absence of all the Vice-Presidents a Member of the Council shall preside; and if no Member of the Council be present at any Ordinary Meeting the Members present shall appoint by a majority to be Chairman such Member as they shall think fit; and the Member of Council so presiding, or the Member so appointed, shall for the time being have all the authority, power, and privilege of the President.

Chap. VIII. *Treasurer.*

1. It shall be the duty of the Treasurer to demand and receive for the use of the Society all sums of money due or payable to the Society, and to disburse all sums payable by the Society out of the funds in his hands.

2. No payment exceeding £5, excepting for rent or taxes, shall be made by the Treasurer without the consent of the Council.

3. The Treasurer shall keep a book of Cheque Receipts for admission fees and annual payments; each Receipt shall be signed by himself, the date of payment and name of Member or Subscriber paying being written both on the Receipt and on the part of the Cheque which is left in the book.

4. The Treasurer shall demand all arrears of annual payment after such payment shall have been due three months.

5. The accounts of the Treasurer shall be audited annually, previously to the Annual Meeting, by a Committee of three Members of the Council and three Members of the Society, to be appointed by the President at the Ordinary Meeting in December, of which Committee three shall be a quorum. The Treasurer shall furnish the Auditors with a detailed account of all receipts and disbursements down to the 31st December.

Chap. IX. *Secretaries.*

1. It shall be the duty of the Secretaries to keep a list of all the Members of and Subscribers to the Society, together with their addresses; to summon Meetings (when necessary) of the Society and the Council; to conduct and produce to the Council all correspondence in any way connected with the Society at the next Meeting after such correspondence shall have been received or taken place; to take Minutes of the Proceedings at Meetings of the Society and the Council; to edit the Transactions and Journal of Proceedings; and, generally, to act under the direction of the Council in all matters connected with the welfare of the Society.

2. In the absence from any Meeting of the Society or the Council of both the Secretaries, Minutes of the Proceedings shall be taken by a Member whom the President shall appoint for the occasion.

Chap. X. *Librarian.*

1. It shall be the duty of the Librarian to take care of the Library and MSS., and keep a Catalogue thereof, with the names of the Donors; to call in all Books borrowed, and see that the Library Regulations are carried into effect.

2. The Council may employ a Sub-Librarian, who shall receive such remuneration as the Council shall from time to time determine, and shall be subject to such Rules and Orders as shall from time to time be given to him by the Council.

Chap. XI. *Library Regulations.*

1. No Member or Subscriber shall, without special permission of the Council, be allowed to borrow from the Library more than four volumes at one time, or, without leave of the Librarian, to retain any volume longer than one month.

2. If any book be torn, injured, lost, or not forthcoming when demanded by the Librarian, full compensation shall be made for the same by the borrower.

3. The Librarian shall call in all books borrowed from the Library on the 5th day of January and 5th day of July in each year; and in case the same be not returned on or before the Ordinary Meeting of the Society in the following month, notice thereof shall be given by him to the Council, who shall then direct a second notice to be sent to the Member or Subscriber retaining any book, and in case the same be not returned within the further space of four weeks from the date of such second notice so sent, such Member or Subscriber shall in future be disqualified from borrowing books from the Library without the special permission of the Council.

4. The Library shall be open to the Members and Subscribers between the hours of one and six p.m. on every week-day, except Saturday, and on that day between one and three p.m.

5. No stranger shall be allowed access to the Library unless introduced by a Member or Subscriber; but a note addressed to the Librarian or Secretary shall be deemed a sufficient introduction.

Chap. XII. *Election of Members.*

1. Every Candidate for admission into the Society shall be proposed by three or more Members, who must sign a Certificate in recommendation of him. The Certificate shall specify the name and usual place of residence of the Candidate.

2. The Certificate for a Member, having been read at one of the Ordinary Meetings, shall be suspended in the room, read again at the following Ordinary Meeting, and the person therein recommended shall be balloted for at the next Ordinary Meeting.

3. The method of voting for the election of Members shall be by ballot, and two-thirds of the members balloting shall elect.

4. Members shall sign the Obligation Book of the Society at the first Ordinary Meeting of the Society at which they are present, and shall then be admitted by the President.

Chap. XIII. *Admission Fee and Annual Contribution.*

1. The Admission Fee for a Member shall be £2 2*s*., the Annual Contribution £1 1*s*.

2. The Annual Contribution for a Subscriber shall be £1 1*s*., without Admission Fee.

3. The composition for a Life Member in lieu of the Annual Contribution shall be £15 15*s*.

4. The Annual Contribution shall become due on the 1st day of January in advance; any Member elected after September will not be called upon for his Contribution for that year.

Chap. XIV. *Withdrawing and Removal of Members.*

1. Every Member or Subscriber, having paid all sums due to the Society, shall be at liberty to withdraw therefrom upon giving notice in writing to the Secretary.

2. Whenever written notice of a motion for removing any Member or Subscriber shall be delivered to the Secretary, signed by the President or Chairman for the time being on the part of the Council or by five or more Members, such notice shall be read from the chair at the two Ordinary Meetings immediately following the delivery thereof, and the next following Ordinary Meeting shall be made a Special Meeting and the Members summoned accordingly, when such motion shall be taken into consideration and decided by ballot; whereat if a majority of the Members balloting shall vote that such Member or Subscriber be removed, he shall be removed from the Society.

3. Whenever any Member of the Society shall be in arrear for three years in the payment of his Annual Contribution, notice thereof in writing shall be given or sent to him by the Treasurer, together with a copy of this section; and in case the same shall remain unpaid, the Treasurer shall give notice thereof to the Council, who shall cause a second similar notice to be sent to the Member, with an intimation that at the expiration of three months he will be liable to have his name erased from the list of Members. In default of payment, the Council may order his name to be erased accordingly.

4. Whenever the Annual Contribution of a Subscriber shall be in arrear one year, such Subscriber shall have his name erased from the list of Subscribers and cease to belong to the Society.

Chap. XV. *Privileges of Members.*

1. Members have the right to be present, to state their opinions, and to vote, at all General Meetings; to propose Candidates for admission into the Society; to introduce Visitors at General Meetings of the Society; to have personal access, and to introduce scientific strangers, to the Library; and Members who have paid the Annual Contribution for the year shall be entitled to receive a copy of the Transactions published during the year.

2. Members shall be eligible to any office in the Society, provided they are not more than one year in arrear in the payment of the Annual Contribution.

3. A Member shall not be entitled to vote on any occasion until he shall have paid his Contribution for the year last past.

Chap. XVI. *Foreign Members.*

1. Any Foreigner, not resident in the United Kingdom, who has distinguished himself as an Entomologist, or who has shown himself able and willing to promote the ends for which the Society is founded, may be elected a Foreign Member; his Annual Contribution shall be £1 1*s*., he shall be exempt from the payment of any Admission Fee, and shall be entitled to the same privileges as an Ordinary Member.

Chap. XVII. *Honorary Members.*

1. Every person proposed as an Honorary Member shall be recommended by the Council; and shall be balloted for, and, if elected, be liable to be removed in the like form and manner, and be subject to the same rules and restrictions, as an Ordinary Member.

2. Honorary Members shall be exempt from the payment of Fees and Contributions, and shall possess all the privileges of Ordinary Members.

3. No resident in the United Kingdom shall be an Honorary Member.

4. The number of Honorary Members shall not exceed ten.

Chap. XVIII. *Ordinary Meetings of the Society.*

1. The Ordinary Meetings of the Society shall be held on the first Wednesday in each month (except January), beginning at seven o'clock in the evening, or at such other time as the Council shall from time to time direct.

2. At the Ordinary Meetings the order of business shall be as follows:—

(1.) The names of the Visitors present at the Meeting shall be read aloud by the President.

(2.) The Minutes of the last Meeting shall be read aloud by one of the Secretaries, proposed for confirmation by the Meeting, and signed by the President.

(3.) The Presents made to the Society since the last Meeting shall be announced and exhibited.

(4.) Certificates in favour of Candidates for admission into the Society shall be read, and Candidates shall be balloted for.

(5.) Members shall sign their names in the Obligation Book, and be admitted.

(6.) Exhibitions of specimens, &c., shall be made.

(7.) Entomological communications shall be announced and read either by the Author or one of the Secretaries.

(8.) When the other business has been completed, the persons present shall be invited by the President to make their observations on the communications which have been read, and on the specimens or drawings which have been exhibited at the Meeting.

3. All Memoirs which shall be read at any Meeting of the Society shall become the property of the Society, unless otherwise stipulated for previous to the reading thereof.

4. No Motion relating to the government of the Society, its Bye-Laws, the management of its concerns, or the election, appointment, or removal of its officers, shall be made at any Ordinary Meeting.

Chap. XIX. *Special Meeting.*

1. Upon the requisition of any six or more Members, presented to the President and Council, a Special General Meeting of the Society shall be convened; a notice thereof shall be sent to every Member whose last known residence shall be in the United Kingdom, at least seven days before such Meeting shall take place; and any proposition to be submitted to such Meeting shall be stated at length in such notice.

2. No vote shall be taken at any Special Meeting unless nine or more Members shall be present.

Chap. XX. *Annual Meeting.*

1. The Annual Meeting of the Society shall be held on the third Wednesday in January.

2. The objects of the Meeting shall be to receive from the Council, and hear read, their Annual Report on the general concerns of the Society; and to choose the Council and Officers for the ensuing year.

3. The Council for the time being shall annually cause to be prepared two Lists, one of which (No. 1 in the Schedule hereto) shall

contain the names of Members whom they shall recommend to be re-elected, and of other Members to be elected into the Council; and the other List (No. 2) shall contain the names of such persons as they shall recommend to fill the offices of President, Treasurer, Secretaries, and Librarian for the year ensuing; which Lists shall be read at the Ordinary Meeting in December, and shall then be fixed up in the room until the day of election. And copies of such Lists shall be transmitted to every Member whose last known residence shall be in the United Kingdom, before the 20th December.

4. If any four or more Members shall desire to substitute the name or names of any other Member or Members to be elected into the Council or to fill any of the offices of President, Treasurer, Secretary, or Librarian, such four or more Members shall give notice in writing to that effect, specifying the name or names of the Member or Members proposed to be substituted; such notice to be given on or before the 31st December to one of the Secretaries, who shall before the second Wednesday in January transmit a List of the names proposed to be substituted to every Member whose last known residence shall be in the United Kingdom.

5. If no such notice be given to either of the Secretaries on or before the 31st December, the Members named in the Lists prepared by the Council shall be the Council and Officers for the ensuing year.

6. If any such notice be given, the election shall be by Ballot at the Annual Meeting, and the President shall appoint two or more Scrutineers from the Members present, not being Members of the Council, to superintend the ballots and report the results to the Meeting. The Secretaries, assisted by the Treasurer, shall prepare a List of the Members entitled to vote, and each Member voting shall give his name to the Scrutineers to be marked on the said List, and shall then put his balloting lists into the respective glasses to be provided for such occasion.

7. Any balloting List containing a greater number of names proposed for any office than the number to be elected to such office, shall be wholly void, and be rejected by the Scrutineers.

8. No Ballot shall be taken unless nine or more Members shall be present.

9. If from any cause an election shall not take place of persons to fill the Council, or any of the offices aforesaid, then the election of the Council and Officers, or the election of Officers, as the case may be, shall be adjourned until the next convenient day, of which notice shall be given in like manner as is directed for the Annual Meeting.

Chap. XXI. *Transactions and Journal of Proceedings.*

1. The Transactions shall consist of such Papers communicated to the Meetings of the Society as the Council shall order to be published therein.

2. The Transactions shall be published quarterly, and at such prices as the Council shall direct for each Part or Volume.

3. Authors of Memoirs published in the Transactions shall be allowed twenty-five copies of their communications gratis. If any additional number be required, the entire expense thereof shall be paid for by the Authors.

4. A Journal of Proceedings of the Society shall also be published, containing Abstracts of the Papers read and Notices of other Matters communicated at the Ordinary Meetings of the Society. The Proceedings shall be bound up with the Transactions.

Chap. XXII. *Alteration of the Bye-Laws.*

Any of the Bye-Laws of the Society may at any time be repealed or altered, or others adopted in lieu thereof, at a Special Meeting of the Society, to be held after a Notice given to the President and Council, signed by six Members at least, and specifying the intended repeal or alteration, has been read at three Ordinary Meetings of the Society.

THE SCHEDULE REFERRED TO IN CHAPTER XX.

No. 1.

Form of List for the Council.

List of Members of the present Council recommended to be re-elected at the Election on the day of January, 18 .*

A. B.	
C. D.	
E. F.	
G. H.	
I. J.	
K. L.	
M. N.	
O. P.	
Q. R.	

List of Members recommended to be elected into the Council:—

S. T.	
U. V.	
W. X.	
Y. Z.	

* If any of the Names in this List be objected to, they must be struck out before the Ballot, and other names, notified as provided by Sec. 4 of Chapter xx. of the Society's Bye-Laws, may be substituted in the blank spaces left for that purpose.

No. 2.

Form of List for the Officers.

List of Persons recommended by the present Council to be appointed to the offices of President, Treasurer, Secretaries, and Librarian, at the Election on the day of January, 18 .*

President	Z. A.	
Treasurer	Y. B.	
Secretaries.....	X. C. W. D.	
Librarian	V. E.	

* If any of the Names in this List be objected to, they must be struck out before the Ballot, and other names, notified as provided by Sec. 4 of Chapter xx. of the Society's Bye-Laws, may be substituted in the blank spaces left for that purpose.

June 6, 1883.

J. W. Dunning, Esq., M.A., F.L.S., &c., President, in the chair.

Donations to the Library were announced, and thanks voted to the respective donors.

Election of a Member.

George Coverdale, Esq. (24, Fleming Road, Lorrimore Square, S.E.), was balloted for and elected a Member of the Society.

The President invited Prof. Westwood, Honorary Life-President, to take the chair, which he accordingly did, and read the following address:—

Gentlemen,

I hardly know how sufficiently to express to you my thanks for the great honour you have conferred on me in unanimously electing me as the Honorary Life-President of the Entomological Society of London, an office hitherto in England held only by the venerable William Kirby; whilst in France Latreille was the only entomologist on whom the Honorary Presidentship of the "Société Entomologique de France" was conferred. Before the names of these "heroes scientiæ" I must hide my diminished head, as nothing which I have ever written can be put in competition with the 'Monographia Apum Angliæ' of Kirby, or the 'Genera Crustaceorum et insectorum' of Latreille. I, however, may without egotism lay claim to two characteristics which have governed me through my long entomological career, namely (1st) an earnest zeal to further the science of Entomology amongst both naturalists and the public by the investigation of difficult materials, and the diffusion of sound knowledge in a more or less popular manner; and (2nd) a thorough perception of the truth of the adage, "ars longa, vita brevis," and a determination to adopt the equally useful adage, "nulla dies sine linea," by constantly employing myself, either in accumulating knowledge of what was being done by my fellow-workers in the Science (to whom I trust I have always done ample justice), or in adding, either by my pen or pencil, original materials to the fast-growing stores of knowledge with which from day to day we have for the last half-century been inundated, and which require, for utilisation, a constant system of assimilation. As a specimen of what may be done in the way of daily registration of observations, I beg leave to exhibit to you the diary of the late John Curtis, which (together with all his unpublished manuscript notes and drawings) has come into my possession from his widow; and, as I consider this to be the best system of daily record of observations with which I have ever been acquainted, I think it quite worthy of the attention of the younger

members of the Society. It is a volume of nearly 400 pages, one of which is devoted to each day throughout the year, and in which, of course, all the current observations of the day are recorded. This being continued from year to year, an easy comparison is afforded at a single glance of the entomological peculiarities at any given day or season: whilst an alphabetical index at the end of the volume to the observations contained therein (which feature, however, is wanting in Mr. Curtis's volume) would be found of great service, as showing the periods of the different phases of life of any given species.

The state of the Science of Entomology, and the means by which it may now most successfully be investigated, are so totally at variance with what they were when about the year 1820 I first commenced the study, that I can but feel that the young student may, and almost necessarily must be, deterred from taking up the pursuit otherwise than in a very cursory and unsatisfactory, or in a very limited, manner. At the period to which I have referred, the system of Linnæus was generally regarded as the *ne plus ultra* of the Science. A few of what we should now regard as quite children's books, such as Pinnock's 'Catechism of Entomology,' 'Anecdotes of Remarkable Insects,' and others of the same class, were, with the exception of Kirby and Spence's 'Introduction,' our only guides. Samouelle's 'Compendium' was commenced and half occupied with the Linnean Arrangement, when the latter half of the volume was, by the advice of Dr. Leach, extended to the then modern system of classification and study which had not long before been introduced in France by Latreille. It was consequently not difficult in those days to obtain a general idea of the insect-world; and entomologists (with the exception of a few "Aurelians," as the students of Lepidoptera were then termed) formed general collections of British insects of all orders, the result of which is well shown in the works of Curtis and Stephens. By degrees, however, the vast number of additions to the British fauna, and the unnumbered hosts of exotic species with which we have been and still are inundated, have gradually rendered it almost necessary for the lover of the Science to restrict himself to the insects of a single order, or even to those of a single family of insects.

In this manner, indeed, most important additions have been made to the stores of entomological science. The labours of Sir John Lubbock on the habits of bees, wasps, and ants; the beautiful works on the Tineidæ by Mr. Stainton; the monographs on the *Carabidæ* by Dejean; the hymenopterous works of the late Frederick Smith; and the dipterous works of the late Professor Loew and of the Baron Osten-Sacken, are all instances of the vast progress made in different directions by continuous specialised labour. Of course to render such labours most efficient it is absolutely necessary that each subject should be thoroughly investigated, and nothing left for future inquiry; the entire organisation of an insect, in all its stages,

must be studied; the opinions of previous writers must be carefully criticised, but not slavishly adopted; and thus works like Lyonnet's wonderful volumes on the *Cossus*, or Victor Audouin's on the *Pyralis* of the vine; and monographs like Kirby's on the British bees, Mr. M'Lachlan's on the Trichoptera, Mr. Eaton's on the *Ephemeridæ*, and Mr. Pickard-Cambridge's on the spiders, will be added to our stores of general knowledge.

When we consider the present state of our knowledge of the vast number of species of insects compared with that of all the other tribes of animals, the young entomologist may well feel appalled at the difficulties which are opened to his view. Thus, whilst Professor Huxley estimates the number of all the known species of animals (exclusive of the Arthropoda) at 50,000, we find nearly 80,000 species of beetles alone catalogued in Harold and Gemminger's list. Such a number of species unfortunately necessitates the creation of vast numbers of new genera, with the still greater multiplication of subgenera or groups established, often recklessly on insufficient or ill-considered characters, all which is unfortunately forming an almost insuperable barrier against the real progress of the science. How this barrier is to be overcome seems to me to be a matter deserving very serious consideration; for, whilst it is necessary in the special investigation of any given group to separate discordant species and regard them as separate genera or subgenera, the requirement of the more general student is opposed to such numerous and often arbitrary divisions which it is impossible for him to study, but of which it is useful for him to have some general idea. An instance of this kind is afforded in the last part of the 'Proceedings' of the Linnean Society, where Mr. W. F. Kirby has established a number of new genera founded upon different thick-thighed species of the older genus *Chalcis*. The species are for the most part South American, and unique in the British Museum Collection, and for more general purposes may well be known and spoken of under the old generic name of *Chalcis*. Fifty years ago, M. Laporte (Comte de Castelnau) partially endeavoured to obviate the difficulty by employing generic names which had evident reference to the principal genus in the group; thus we had genera or subgenera *Lucidota*, *Luciola*, *Lucio*, and *Lucernuta* established in the family *Lampyridæ* (Ann. Soc. Ent. France, vol. ii., 1833).

The same difficulty exists in the elevation of local forms or geographical subspecies to the rank of distinct species without a due consideration of the primitive forms from which they have probably sprung. The consideration of the nature of the differences which distinguish these various forms and the possible cause of their origin deserve the most attentive consideration of the student, although the evidences of their origin may be as difficult to investigate as those on which the varieties of the human race or those of our domestic animals have originated, of which also amongst plants the genera *Rosa*, *Ranunculus*, and *Salix* afford equally difficult examples. In

this point of view the recent memoir of Dr. Hagen on the variations of *Papilio Machaon* is of great interest, although the difficulty of the subject has already been manifested by the opposition to Dr. Hagen's views of so excellent a lepidopterist as Mr. Edwards.

I should be unwilling in this view of the subject to deny the intimate connection of this question with the Darwinian theory of development, but I would earnestly discourage my young hearers from following this attractive theory too far, as it appears to me that it can only end in vague speculations impossible of proof, especially whilst there still remain so many interesting and important points which are capable of solution by a careful and long-continued course of investigation.

In addition to the systematic labours of the monographer and student of the modern classification and description of species, the life-history researches of such writers as DeGeer and Réaumur; the special morphological memoirs, such as those of Lyonnet on the *Cossus*, or Straus Durckheim on the Cockchaffer, or that of Mr. P. H. Goose on the clasping organs of male butterflies just published in the 'Transactions' of the Linnean Society, we must now add another special branch of the science, that of Economic Entomology,—that is, the investigation and publication of the natural history of such species of insects as are either beneficial or obnoxious to mankind. The labours of John Curtis, as exhibited in his fine work 'Farm Insects,' must here be referred to, and those of Miss Eleanor Ormerod, whose unwearied proceedings are manifested in her 'Annual Reports' and in her most useful 'Manual of Injurious Insects.' In America this branch of the subject has been carried much further than in England, the appointment of State Entomologists by several of the leading States of the Great Republic having led to the publication of several very valuable series of annual reports on obnoxious insects by Messrs. Riley, Comstock, and others. The attention of our own Government has at length been directed to the importance of this branch of the subject, and I believe I am at liberty to mention that an important step will be shortly carried out for bringing the subject in an official and satisfactory manner before the general public.

As I have elsewhere ventured to remark, the investigation of the precise nature of the variations in any given species in a state of nature and the causes which have led to such variations are of far higher importance either than the establishment of new and independent species, or the study of analogous modifications produced like those of pigeons under a state of domestication.

There is still another field of investigation opened to the entomologist by the recent improvements in microscopes, especially in the movable apparatus, by which lenses of different powers are brought to act upon objects by means of a simple revolving disc upon which they are fixed. A still

more important apparatus has been invented for marking the most delicate sections of the various organs of insects; and here I may suggest that it is much to be wished that the attention of some of our entomologists was directed to the internal anatomy of insects, which, by the aid of the last-mentioned apparatus, is shown out in a wonderful manner, and is much facilitated, an example of which may be noticed in Sir John Lubbock's plates of the internal anatomy of the head of the ant, and especially in Mr. George Dimmock's inaugural memoir on the parts of the mouths of the gnat and other dipterous insects.

It is with great pleasure that I have witnessed the gradual development of the entomological collections of the British Museum, now, I venture to say, the finest in the world. Let us hope that their removal from Bloomsbury to their magnificent new home at South Kensington will be safely effected, and that their new domicile on the ground floor of that establishment will be less disastrous than that which has attended the location of the fine collection of insects in the New Museum of Geneva, where, from the misplaced position of the entomological laboratory, mould to a terrible extent has assailed the collections, the very valuable one of Mr. Melly having, however, escaped by being placed in an upper room.

In conclusion, I cannot too strongly insist on the necessity of investigating the correlation between the various structures of insects and their corresponding habits; believing as I do that every variation of structure has resulted from a preconceived design, and that nothing has been left to blind chance, or to the power of external forms in developing previously non-existent structures into a permanent specialized condition.

Exhibitions, &c.

Mr. J. W. Slater exhibited a large case containing numerous specimens of Lepidoptera from Zululand.

Prof. Westwood made some detailed remarks on some of the specimens, especially on the Rhopalocera and *Bombycidæ*, noticing various rare and beautiful species of *Acræa* and a pair of the rare *Bombyx Oubie*, Guér., figured in Lefebvre's 'Voyage en Abyssinie' (Ins. pl. xii. figs. 1, 2), but hitherto otherwise unknown to him.

Mr. W. F. Kirby exhibited an object found in a nest of *Formica nigra* in Ayrshire by Mr. P. Cameron.

Prof. Westwood suggested that it was the pupa, or rather the indurated skin, of some syrphideous insect.

Baron Osten-Sacken, who was present as a visitor, said it was certainly the pupa of one of the *Syrphidæ*, probably of *Aphritis aureopubescens*, Latr.*

* In Bull. Soc. Ent. France (6, pp. xcvii, cvi; Sept. 1882) it is mentioned that M. V. Mayet, of Montpellier, frequently finds larvæ and pupæ of *Microdon mutabilis*, L. (= *Aphritis aureopubescens*, Latr.) in nests of *Lasius niger*.—W. F. K.

Mr. E. Saunders exhibited a specimen of *Lebia turcica*, Fabr., recently captured by Mr. W. H. Bennett in a clearing in a wood at Guestling, near Hastings. Mr. Saunders remarked that this species had been omitted from the two recently-published British catalogues.

Mr. M'Lachlan enquired whether any member present had heard of other recently-reported captures of this insect.

Rev. H. S. Gorham said there had been no other recent capture, and he fully believed in the authenticity of this one. The species was figured by Curtis, and he saw no reason to think the specimen now exhibited was imported. *Lebia crux-minor* was almost unique until taken in some numbers in a marshy spot at Holme Bush, near Brighton, by Dr. Power; it had not since been found there, although he and Mr. Lewis had often hunted the exact spot. Mr. Gorham believed the recent fine weather had contributed to the occurrence of this interesting species, and that if the fine season lasted he expected many other rare species to be captured.

Mr. E. A. Fitch exhibited specimens of *Ixodes* sp.? taken from sheep at Maldon; this was with reference to some recent remarks by the Rev. L. Blomefield, in which he says, "I can remember no instance of an *Ixodes* found on sheep, though I would not undertake to say they never occur on that animal" ('Nature,' vol. xxvii. p. 553; April 12, 1883). Mr. Fitch believed the occurrence of *Ixodes* on sheep to be very rare in the Eastern Counties; from the evidence of a gang of sheep-shearers of large experience he could only gather that they had met with these true ticks on three or four occasions during the last fifty years; it appeared to be otherwise further north. Mr. Fitch then read a letter from Mr. Eliott Lockhart, of Branxholme, Hawick, N.B., giving some very full information of tick-attacks on sheep, and making numerous inquiries about the life-history of the *Ixodes*, which Mr. Fitch hoped some members of the Society would be able to supply. This matter had a very practical importance, as the *Ixodes* were supposed to be the cause or necessary agents in producing that fatal malady "louping-ill" or "trembling" amongst sheep. Extracts from the Reports of the Louping-ill Committee of the Teviotdale Farmers' Club were read, and Prof. Williams' reports, printed in the 'Transactions of the Highland and Agricultural Society' (1882, pp. 176—201), and Mégnin's 'Les Parasites,' p. 377, were referred to. The *Ixodes* appeared to occur commonly as far south as the hills of Cumberland and Northumberland, and wherever the ticks occurred louping-ill was prevalent. Mr. Todrick notices the presence of *Ixodes* and a disease with similar symptoms to louping-ill on the hill-farms of Devon, and Prof. Rutherford notes their existence in Cornwall. The northern ticks had been determined by Mr. F. Moore and the Rev. O. P. Cambridge to be *Ixodes erinaceus*, Aud., and *I. marginatus*, Leach. Mégnin says *I. reduvius*, DeG., is the species most commonly found on sheep, but mentions five other species which had occurred.

Miss E. A. Ormerod, Mr. M'Lachlan, Lord Walsingham, Mr. Distant, and Prof. Westwood made some remarks in connection with the above.

Mr. Frank Cheshire, who was present as a visitor, made some observations on section-cutting in the probosces of honey-feeding insects, as referred to by Prof. Westwood in his address. He recommended that the insect to be operated upon should be kept fasting for some time and then fed upon honey mixed with gelatine impregnated with some highly coloured dye; the insect should be immediately decapitated and the head rapidly cooled; it should then be embedded in gelatine and the section cut by means of the microtome. The mouth-passage is then easily seen from the presence of the dye. Mr. Cheshire then made some extended remarks on his various observations upon the minute structure and anatomy of the honey-bee, stating that many of his results differed much from the generally received authoritative statements. With regard to the tongue of the honey-bee, many authrities regarded it as a tube through its entire length, others as a gutter or trough, while in reality it is a trough on the upper side at the apex and a tube for the rest of its length; the structure of the extreme apex (Réaumur's "bouton"),—about which there existed so much difference of opinion,—was easily made out by the use of the means Mr. Cheshire recommended.

Papers read.

Mr. H. W. Bates read the "Supplement to the Geodephagous Coleoptera of Japan, chiefly from the collection of Mr. George Lewis, made during his second visit from February, 1880, to September, 1881." 118 new species had been discovered by Mr. Lewis, but, with those discovered by other collectors, 159 were added to those noticed in Mr. Bates's paper published in the 'Transactions' for 1873, *viz.*, 244, three of which are synonyms. General and special remarks on the geographical distribution and local variation of the various species are included in the paper, Mr. Bates remarking that "the prevailing character of the Japanese fauna in the great section of the Coleoptera to which this paper refers is Palæarctic or North Temperate, but the presence of many tropical genera and species is of great interest." In reply to Prof. Westwood, Mr. Bates said he had included but one new species of *Damaster* (*D. capito*, Lewis), which was very distinct.

Mr. R. Trimen communicated "Descriptions of twelve new species of South-African Lepidoptera Rhopalocera." These comprised one of the *Nymphalidæ*, six *Lycænidæ*, two *Papilionidæ*, and three *Hesperiidæ*.

July 4, 1883.

Prof. J. O. Westwood, M.A., F.L.S., &c., Hon. Life-President, in the chair.

Donations to the Library were announced, and thanks voted to the respective donors.

Election of a Member.

A. Eland Shaw, Esq. (92, Elgin Road, Harrow Road, W.), was balloted for and elected a Member of the Society.

Exhibitions, &c.

Mr. R. M'Lachlan exhibited specimens of *Phylloxera vastatrix*, Planch., from the roots of vines belonging to Mr. J. E. Lightfoot, Mayor of Accrington.

Prof. Westwood remarked that he became acquainted with the *Phylloxera* in Britain as long ago as 1862, and that on November 25th, 1867, he described and figured this insect, at a meeting of the Ashmolean Society in Oxford, under the name of *Peritymbia vitisana*, which name (had the Proceedings of the Ashmolean Society been regularly published) would have had priority over M. Planchon's *Rhizaphis vastatrix*.

Miss E. A. Ormerod exhibited a bunch of *Atherix Ibis*, Fabr., found on a sprig of alder overhanging water at Hampton Court by Mr. J. Arkwright. The swarm of flies measured about 6 in. long by 3 in. broad, and consisted of many thousand specimens.

Mr. E. A. Fitch called attention to the figure of a similar swarm of this species in the 'Compte-rendu' of the Société Entomologique de Belgique for July 4th, 1874.

Mr. W. L. Distant exhibited specimens of four of the five known species of American *Fulgoridæ*. Three were from Central America.

Mr. G. C. Champion stated that in Central America he had kept forty or fifty specimens alive for days, and had seen no trace of luminosity, neither did they stridulate; the evidence of the natives also was quite against these insects being luminous. The *Fulgoridæ* were very sluggish in their habits, Mr. Champion observing that he commonly found specimens on the trunks, where they sometimes remained for days; he had never seen a specimen on the wing. Mr. Champion also related that he had not infrequently found larvæ attached to and feeding on the white cottony secretion so abundant about some of the smaller *Fulgoridæ;* he had found as many as three larvæ attached to one imago.

Prof. Westwood commented on the great interest of this last announcement, remarking that the three cases of lepidopterous parasitism on the *Fulgoridæ* already recorded by him (Trans. Ent. Soc. Lond. 1876, p. 519; 1877, p. 433) occurred on eastern species. He was glad to hear that

Mr. Champion had sent home specimens of the parasitic larvæ, and hoped that further information would be attainable.

The Secretary, on behalf of Mr. G. Lewis, exhibited the types and material used by Dr. Sharp for his memoir on the Japan *Pselaphidæ*. Also the specimens on which Mr. Lewis has founded his new species of *Lucanidæ*, and which will be figured in the 'Transactions.' Another box was also exhibited containing twenty-four male examples of *Cladognathus inclinatus*, Motsch., showing the large and small forms with various connecting links; thirteen male forms of *Macrodorcus striatipennis*, Motsch., exhibiting the connecting forms between it and *C. opacus*, C. Waterh., and *C. Vanvolxemi*, Lewis; also three examples of *Lucanus maculifemoratus*, Motsch., of very various sizes.

Papers read.

Dr. D. Sharp communicated a "Revision of the *Pselaphidæ* of Japan." These consist of sixty-seven species assigned to seventeen genera, nine of which are peculiar to Japan. The Japanese Pselaphid fauna was contrasted with that of Europe and North America, but the amount of endemic peculiarity could not yet be determined on account of the imperfect state of our knowledge of the Entomology of the neighbouring regions.

Mr. G. Lewis communicated a paper "On the *Lucanidæ* of Japan." The synonymy of the fifteen species of *Lucanini* and one of *Passalini* was fully set forth, many corrections becoming necessary. Five new species were described and figured. Mr. Lewis remarked on the different forms existing in the various species, and stated that he believed these were due to the food of the larvæ—whether the diet of the individual larva was nutritious and abundant or otherwise.

Prof. Westwood remarked that the great modifications in the size, curvature, deflection and dentition of the mandibles in male *Lucanidæ* required great caution in not too hastily assuming identity of species in cases of great individual divergences.

Dr. F. Leuthner, who was present as a visitor, made some extended remarks on the geographical distribution of *Lucanidæ*, also upon the polymorphic forms in the *Odontolabini*, which had hitherto been regarded as something more than varieties. He did not consider *Æsalus* a Lucanid, especially from an examination of its genital organs, but could not now define its natural position.

Mr. P. Cameron communicated the "Descriptions of sixteen new species of parasitic *Cynipidæ*, chiefly from Scotland."

Prof. Westwood read a "Further notice concerning the Fig Insects of Ceylon," pointing out that Dr. Meyer's statement as to the sexes of the *Ichneumon ficarius* is fully confirmed, but whether the male was identical with *Sycoscaptella 4-setosa*, Westw., required further examination.

August 1, 1883.

J. W. Dunning, Esq., M.A., F.L.S., &c., President, in the chair.

Donations to the Library were announced, and thanks voted to the respective donors.

Election of a Member.

W. H. B. Fletcher, Esq., M.A. (6, The Steyne, Worthing, Sussex), was balloted for and elected a Member of the Society.

Exhibitions, &c.

Mr. T. R. Billups exhibited specimens of both sexes of *Pompilus spissus*, Schiödte, captured at Headley Lane in June last.

Mr. E. A. Fitch stated that Dr. Buchanan White had called his attention to the possibility of the supposed gall on twigs of juniper received from Mentone, and figured on p. vi of the 'Proceedings' for this year, being really a fungus. He had sent the remains of the specimen to Dr. Buchanan White, and had received the following note in reply:—

"I have examined the juniper twigs you have kindly forwarded, and find that my surmise was correct. The galls turn out to be, as I suspected, a species of *Podisoma*, a peculiar and rather abnormal genus of *Pucciniæi*. The fungi of this family form pulverulent masses in or on leaves, but in *Podisoma* (or the doubtfully distinct *Gymnosporangium*) the pseudospores are not dusty, but imbedded in a gelatinous stratum, and are parasitic on the stems of different species of juniper. This is not the first occasion on which these fungi have been mistaken for galls. They cause the twigs and stems of the attacked plant to form large club-like swellings (your specimen shows this in some degree), and these have been thought to be galls, though no animal was found in them. The swellings are persistent, and the gelatinous mass of the fructification of the fungus appear on them year after year at the proper season (usually in spring). I have frequently found orange-coloured Cecidomyideous larvæ living upon different kinds of fungi, but usually quite exposed. Your specimen is interesting from the way in which the larvæ have made habitations out of the fungus. As several species of *Podisoma* and *Gymnosporangium* occur in England, it would be worth while noticing if they are attacked in a manner similar to the Mentone one. I enclose a rough drawing of the pseudospores, taken from your specimen."

Mr. Fitch also read a note from Mr. Charles B. Plowright, giving the specific name of the fungus as *Gymnosporangium juniperina*, Linné, and continuing:—"It is a heterœcious fungus; its other state is found upon *Sorbus aucuparia*, and is known as *Rœstelia cornuta*, Tul. Many insects are recorded by E. Ráthay, in his 'Untersuchungen über die Spermogonien

der Rostpilze' (Denk. Akad. Wiss. Wien., xlvi., 4—52; 1881), as feeding upon this last-named form—the *Ræstelia*, viz.:—Coleoptera 9 species, Hymenoptera 9, Diptera 18, Hemiptera 1, and some 7 ants."

Sir Sidney Saunders communicated the purport of two letters addressed to him by M. Edmond André, of Beaune, upon the subject of the terminal segments "des Chalcides à queue"; stating that, after further investigation, he concurred in considering Sichel's so-called *hypopygium* in those genera (Proc. Ent. Soc. Lond., 1882, p. xxvi, fig. 7 D) as a conjoint segment comprising the dorsal and ventral arcs of the 7th. This he intends to notice in the 'Annales' of the French Entomological Society.

Mr. R. Meldola, who had lately received numerous notes on entomological subjects from Dr. Fritz Müller, which were of considerable interest, communicated a short paper:—

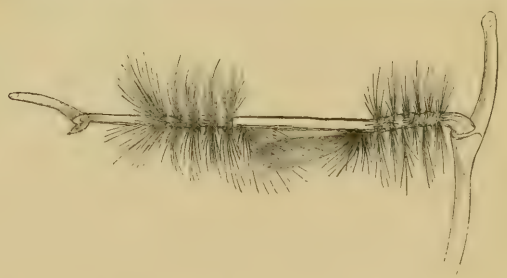
Entomological Notes from Brazil.

1. *Persecution of distasteful Butterflies by Birds.* — Fritz Müller's proposed extension of the theory of mimicry to the case of distasteful genera, which I had the pleasure of communicating to the Society four years ago (Proc. Ent. Soc. Lond., 1879, p. xx) necessitates the sacrifice of a certain percentage even of uneatable butterflies through the inexperience of young birds, &c. As some reluctance was shown to the acceptance of these new views, owing to the want of direct evidence, I wrote to Dr. Müller to ask him to make some observations or experiments bearing upon this point, and last year he sent me a specimen of *Heliconius eucrate*, Hübn., having a jagged notch broken out from corresponding positions on the two front wings, as though the insect had been pecked at when at rest by a bird (see Ann. & Mag. Nat. Hist., Dec. 1882, p. 419). Some further observations have been made this year by the same observer, who devoted a week to the observation of the undoubtedly nauseous *Acræa Thalia*, Linn., which swarms in vast numbers, and is well known to be the subject of imitation by other non-protected species. Dr. Müller states that as a result he found more than thirty specimens having the wings notched in a manner that can only be explained by the peck of birds. Some of these examples, of which thirty-six were enclosed in his letter, are herewith exhibited.

2. *The colour of the Pupa of Papilio Polydamas*, Linn.—According to the observations of Wood on *Pieris rapæ*, and of Mrs. Barber on an African butterfly, *Papilio Nireus*, Linn., the colour of the pupa of these insects is determined by the colour of the object on which the larva pupates. This does not hold good, however, for all butterflies of which the pupæ are differently coloured; it is not the case, for example, with *Papilio Polydamas*. The pupæ of this butterfly, of which large numbers have been seen by Dr. Müller, are either green or brown, intermediate colours having never been found. The ground-colour of the larvæ living on *Aristolochiæ* varies

within wide limits, entirely black and bright yellowish or reddish brown caterpillars being rare, whilst all possible shades between these extreme colours are commonly found. Nevertheless the colour of the caterpillar has nothing to do with that of the pupa, and from both kinds of pupæ similarly coloured butterflies are developed, both males and females. The butterfly lays from four to six eggs close together; the young larvæ remain in company till the second moult; they feed on the same leaf, and repose close together, like the gregarious caterpillars of *Papilio Evander*, Godt., which live in this manner till they pupate. Such a society of young larvæ, which Dr. Müller had observed from the egg in his garden, was transferred to a large glass vessel just before the larvæ distributed themselves over different leaves. When about to pupate they were placed in a case, of which the two larger sides were of white gauze, and the smaller sides and the top and bottom of grey paper. The larvæ attached themselves to a thin leafless stem of *Aristolochia*. Out of five caterpillars two changed into brown and three into green pupæ; a brown and green pupa were on the same twig, less than their own length from one another. The caterpillars emerged from the egg at the same time, and shed their larval skin simultaneously, whilst they were exposed to the same external conditions during their whole life, being exposed to the same action of light, and having at the time of pupation neither brown nor green in their environment. Dr. Müller concludes from this experiment that in the case of this species the colour of the pupa certainly does not depend upon the colour of its surroundings.

3. *How the Caterpillar of Eunomia Eagrus*, Cram., *employs its hairs.**— Many lepidopterous larvæ spin the hairs with which they are often so richly



adorned into the cocoon in which they pupate, thereby not only giving to the latter great thickness and solidity with a minimum expenditure of silk, but sometimes also the property of frightening away many foes by exciting on contact an almost unsufferable stinging and irritation. *Eunomia Eagrus*, a clear-winged Glaucopid with a red hairy body, employs the hairs of the caterpillars in a quite different and peculiar manner as a protection during

* 'Kosmos,' vi. Jahrg. (Bd. XII.), p. 449.

its pupal period. On the thin twig on which the pupa is to be fastened the larva forms with its hairs, both in front and behind, half-a-dozen circlets, which it fixes upright round the twig in close proximity. The last hairs are brought close up before and behind so that they incline over the head and tail end of the pupa. The latter thus rests secure from the attacks of small non-flying foes, such as ants, &c.

A box containing numerous bird-pecked specimens of *Acræa Thalia* was exhibited.

The Secretary read some notes on the habits of two Australian species of *Trigona* by Mr. H. J. Hockings, and exhibited numerous specimens in illustration thereof.

New Part of 'Transactions.'

Part III. of the 'Transactions' for 1883 was on the table.

September 5, 1883.

J. W. Dunning, Esq., M.A., F.L.S., &c., President, in the chair.

Donations to the Library were announced, and thanks voted to the respective donors.

Election of a Member.

Baron C. R. Osten-Sacken (Heidelberg) was balloted for and elected a Member of the Society.

Exhibitions, &c.

Mr. F. Enock exhibited a perfectly bilateral hermaphrodite *Macropis labiata*, Panz., the antennæ, face, palpi, mandibles, legs, and genitalia

showing very characteristically; the right side was male, the left female (see figure). The specimen was captured at Woking Station on August 7th

last, when the species was quite plentiful at the flowers of thistles, *Lysimachia*, and *Potentilla comarum*.

Sir Sidney S. Saunders exhibited specimens of the true *Cynips caricæ* of Hasselquist, received from Smyrna, and made some remarks on their identity with Westwood's *Idarnella*. Also specimens of a new species of *Idarnella* (*I. aterrima*) from Australia, and the larva of a *Chrysopa* found in the Smyrna figs; more than one of these larvæ were found in a single fig. Sir S. Saunders also read a note on caprification.

Mr. G. Coverdale exhibited four specimens of *Grapholitha cæcana*, Schläger, a Tortrix new to Britain, taken near Deal early in July amongst *Ononis*.

Paper read.

The Rev. H. S. Gorham read a "Revision of the genera and species of Malacoderm Coleoptera of the Japanese Fauna; Part I. *Lycidæ* and *Lampyridæ*." Eighteen species of *Lycidæ*, nine of which were described as new to science, and eight of *Lampyridæ*, two of which were new, were included.

A discussion on various points connected with geographical distribution, arising out of Mr. Gorham's remarks, and especially as to the number of cases known of undifferentiated genera occurring throughout the world, then followed, in which Messrs. M'Lachlan, Salvin, Stainton, Distant, Weir, and Gorham took part. *Vanessa cardui*, L., *Pantala flavescens*, Fabr., and the trimorphic forms of *Nezara viridis*, L., were mentioned as being of cosmopolitan distribution, and *Danais Archippus*, Fabr., was instanced as a species which had but lately taken to migration, being now found in Britain, the Azores, New Caledonia, and various oceanic islands, where it was previously known not to occur.

October 3, 1883.

R. M'Lachlan, Esq., F.R.S., &c., Vice-President, in the chair.

Donations to the Library were announced, and thanks voted to the respective donors.

The Chairman announced that the Insect Room in the new Natural History Museum, South Kensington, was now open to visitors, but that the public galleries were not yet open.

Election of Members.

John Hartley Durrant, Esq. (Bancroft House, Hitchin), and George W. Oldfield, Esq., M.A. (48, Beaumont Street, Devonshire Place, W.), were balloted for and elected Members of the Society.

Exhibitions, &c.

Mr. F. P. Pascoe exhibited *Ledra aurita*, L., captured on an oak at Wimbledon; *Nabis brevipennis*, Hahn, from Darenth Wood, off oak, and *Aræopus pulchellus*, Curtis, captured on *Scirpus lacustris*, at Sheerness.

Mr. E. P. Collett, who was present as a visitor, remarked that he had captured a single specimen of *L. aurita* at Hollington Wood, near Hastings.

Mr. T. Wood exhibited a specimen of *Malthodes*, sp.? which he had taken at Dulwich this year. Dr. Power considered it to be a new species, allied to *M. atomus*, Thoms., but much larger.

Mr. W. F. Kirby, on behalf of M. Alfred Wailly who was present as a visitor, exhibited a large box containing numerous bred specimens of various silk-producing *Bombycidæ*, &c., viz.:—*Samia Cecropia*, Linn., *S. Gloveri*, Strick., and a hybrid between these two species, *S. Promethea*, Dru., *Telea Polyphemus*, Cram., and *Hyperchiria Io*, Fabr., all North American species. Also a specimen of *Daraapsa Myron*, Cram., with its pupa-case, which was found in M. Wailly's garden at Tudor Villa, Norbiton, and whose presence there could not be accounted for; specimens of a species of *Hemaris* which Mr. Kirby considered to belong to *H. diffinis*, Harr., several specimens of *Apatura Clyton*, Boisd., with their pupa-cases, reared on five small trees of *Celtis orientalis* grown in one pot; five specimens of *Attacus Cynthia*, Dru., reared most successfully on the lilac and laburnum trees in M. Wailly's garden; a long series of varieties of the Indian *Antheræa Paphia*, Cram. (*Attacus Mylitta*, Dru.,), varying in colour from bright golden yellow to the darkest brown or grey; a pair of the giant Himalayan race of *Attacus Atlas*, Linn., measuring over ten inches in expanse of wings, and a male of the small Ceylon race. One extraordinary specimen of a *Samia* was very notable; on this Mr. Kirby read the following note:—

Abnormal specimen of the genus Samia.

"This remarkable specimen, which has puzzled every entomologist who has seen it, was bred by M. Alfred Wailly from a cocoon received from some part of North America. It may be a hybrid between *S. Cecropia* and some other species; but if so it is so different from all the other known species that it is difficult to guess with what it could have been crossed. It is equally difficult to imagine that it is a new species. The specimen is a female, and equals the largest specimens of *S. Cecropia* in size, measuring fully 6¾ inches in expanse; and the wings are more rounded and less oblique than in *Cecropia*. The body resembles that of *Cecropia*, except that the abdomen is banded with yellowish grey and black. The base of the fore wings is brown, thickly scaled with white towards the costa; below this is a brick-red blotch, longer and narrower than in

Cecropia. Beyond this is a white space, extending nearly from the base to one-third of the length of the wing on the outer margin, but curving up to the costa in a rather narrow stripe. This is followed by a large irregular black blotch, broad on the costa (where it is thickly dusted with grey), and the narrow end extends to beyond the middle of the wing. On this stands the large white kidney-shaped central spot, which is surrounded with red, and divided by a reddish stripe at the outer end of the black blotch; it extends beyond it into a broad red white-dusted band, followed by a black one, so very thickly dusted with yellowish grey that it appears of that colour. This is succeeded by a grey space, divided by a black line (much less indented than in *Cecropia*) into darker and lighter; above is a blue space; in the inside is a row of rather large black spots, the uppermost and the 4th and 5th being the largest. Hind wings white at the base, followed by a broad slate-coloured space, on the outer half of which stands a large oval white spot, slightly surrounded with red, the outer part being incomplete, as it rests on a white band, much broader than in *Cecropia*, followed by a broad red band, three or four times as broad as in *Cecropia;* but followed outside by similar markings, only paler. The under surface differs from *Cecropia* chiefly in the much paler colour, and in the different position of the central spots."

M. Wailly also exhibited four living larvæ of *Hyperchiria Io*, Fabr. (which sting like nettles), and two of *Telea Polyphemus*, Cram., which had been reared on small oak and willow trees in the open air at Norbiton, Surrey.

Mr. W. F. Kirby exhibited two examples of a *Zygæna* thought to be a variety of *Z. meliloti*, Esp., captured by Mr. Prest near York.

Mr. J. Jenner Weir considered that in the specimen exhibited the upper spot of the two central ones was rounder, and that the fringes were narrower than is usual in *Z. trifolii*, also that these specimens were larger than *Z. meliloti*, and that in this species the fore legs were generally light-coloured, which was not so perceptible in these specimens.

Mr. G. T. Porritt said these specimens were taken on the same ground as where *Z. loniceræ* commonly occurs, and that doubtless they were a form of that species; he remarked that he had bred specimens of *Z. filipendulæ* with similar semi-transparent bluish fore wings instead of green.

Mr. T. R. Billups exhibited specimens of the celery fly (*Acidia heraclei*, L.), and remarked how very destructive it had lately proved in the celery gardens around London. Messrs. M'Lachlan, Stainton, and Fitch had not noticed its abundance this year; the former recommended a trial of Riley's remedy of kerosene and milk emulsion.

Mr. Billups also exhibited a small larva which he had found attached to a specimen of *Proctotrypes*, and which he stated had been thought to belong to one of the *Meloïdæ*.

Sir Sidney Saunders exhibited numerous larvæ of *Meloe*, which proved

to be very distinct from Mr. Billups' specimens. Mr. Fitch thought the larva belonged to one of the *Staphylinidæ*.

Dr. D. Sharp communicated a note changing the specific name of *Batrisus spinicollis*, Sharp (Trans. Ent. Soc. Lond., 1883, p. 304), to *B. armaticollis*, and that of *B. similis*, Sharp (*l. c.*, p. 319) to *B. affinis*; the specific names first employed having been previously used.

Paper read.

Mr. W. F. Kirby read "Notes on the Diptera of New Zealand, supplementary to Prof. Hutton's last Catalogue of 1881." Three new species are described, and some synonymy corrected, so that the number of species now admitted stands at 125 against 119 in Hutton's Catalogue.

Mr. E. Meyrick, who had lately returned from Australia and New Zealand, remarked that the number of Diptera recorded from New Zealand was not a tenth part of that occurring there. The islands were rich in species, many of them being also very abundant. Lepidopterous larvæ suffered greatly from dipterous parasites, which were far more numerous than *Ichneumonidæ*. In the case of some abundant *Tortricina* it was difficult to find a larva not infested with them.

Mr. Meyrick also called attention to a peculiarity of the New Zealand insect fauna. The islands were composed partly of bare mountain ranges, partly of low-lying forest. The mountains, although very bleak and shelterless, had an extensive and varied fauna, fresh species of insects occurring on every mountain visited; the genus *Crambus*, for example, was represented by a variety of species, for which there seemed to be no special reason. On the other hand, the forests, which comprised a remarkable number of trees and shrubs apparently well suited for food, were strangely deficient in insects, and further, the same species occurred nearly throughout the islands. It appeared, in fact, that a vast number of situations suitable for insects were not utilised. This was the case with the Lepidoptera and Coleoptera, and probably with the other orders. He then remarked how very different a state of things appeared to exist in the Hawaiian Islands; there he had seen an abundance of insect-life, quite distinct from anything occurring in New Zealand; for instance, within a few hours of landing he noticed five or six species of dragon-flies, three species of humble-bees, and two or three large wasps.

Mr. F. P. Pascoe said he could quite confirm these remarks on the absence of insects in the forests. Entomologically speaking, he considered New Zealand one of the most barren countries he had visited; he should like to ask Mr. Meyrick how the question of the fertilisation of red clover by the humble-bee now stood.

Mr. Meyrick replied that Mr. Armstrong, of Christchurch, who had made observations for several years, had found that in New Zealand the

red clover was repeatedly visited and fertilised by the common hive-bee; seeds were produced, but apparently in much smaller proportion than elsewhere. The red clover did not, however, maintain itself in a wild state, and the Acclimatisation Society proposed to introduce the humble-bee.

November 7, 1883.

J. W. Dunning, Esq., M.A., F.L.S., &c., President, in the chair.

Donations to the Library were announced, and thanks voted to the respective donors.

Election of a Member.

Robert Jervoise Attye, Esq. (Ingow Grange, Stratford-on-Avon), was balloted for and elected a Member of the Society.

Exhibitions, &c.

Mr. F. Enock exhibited a living male and female *Atypus piceus*, Sulz., from Woking. He remarked that although this spider was generally considered rare he had no difficulty in always obtaining as many specimens as he required.

Mr. T. R. Billups exhibited specimens of the following twenty-four species of aculeate Hymenoptera, captured at Margate on August 1st, 1883, viz.:—*Lasius niger*, Linn., *Priocnemis obtusiventris*, Schiödte, *Tachytes pectinipes*, Linn., *Cemonus lethifer*, Shuck., *Oxybelus uniglumis*, Linn., *Odynerus parietum*, Linn., *Prosopis communis*, Nyl., *P. signata*, Panz., *Sphecodes similis*, Wesm., *Halictus leucozonius*, Schrank, *H. cylindricus*, Fabr., *H. subfasciatus*, Nyl., *H. villosulus*, Kirby, *H. nitidiusculus*, Kirby, *H. minutissimus*, Kirby, *H. morio*, Fabr., *H. leucopus*, Kirby, *Andrena bicolor*, Fabr., *Nomada jacobææ*, Panz., *Megachile centuncularis*, Linn., *M. Willughbiella*, Kirby, *Anthidium manicatum*, Linn., *Osmia rufa*, Linn., and *Bombus sylvarum*, Linn. Also the following Ichneumonidæ, taken at Sevenoaks and Headley Lane in June, 1883:—*Ichneumon vaginatorius*, Linn., *I. confusorius*, Gr., *I. latrator*, Fabr., and var. *means*, Gr., *I. nigritarius*, Gr., *I. fabricator*, Fabr., *I. lanius*, Gr., *I. sanguinator*, Rossi, *Exophanes exulans*, Gr., *Dicælotus pumilus*, Gr., *D. parvulus*, Gr., *Centeterus picticollis*, Wesm., *Phæogenes scutellaris*, Wesm., *P. fulvitarsis*, Wesm., *P. ischiomelinus*, Gr., *Phygadeuon troglodytes*, Gr., *P. abdominator*, Gr., *P. jucundus*, Gr., *P. sp.?*, *Cryptus stomaticus*, Gr., *Hemiteles bicolorinus*, Gr., *Pezomachus Neesii*, Först., *Ophion luteus*, Linn., *O. minutus*, Kriechb., *Agrypon flaveolatum*, Gr., *Paniscus virgatus*, Fourc., *Campoplex mixtus*, Gr., *C. erythrogaster*, Först., *Limneria tristis*, Gr., *Atractodes vestalis*, Hal.,

Thersilochus sp.?, *Catoglyptus fuscicornis*, Gmel., *Tryphon consobrinus*, Holmgr., *Cteniscus subnitidus*, Gr., *Chorinæus cristator*, Gr., *Bassus flavomaculatus*, Gr., *Pimpla turionellæ*, Linn., *P. flavonotata*, Holmgr., *Meniscus murinus*, Gr., *Phytodiætus coryphæus*, Gr., *Chelonus oculator*, Fabr., *Ganychorus diversicornis*, Ns., *Macrocentrus infirmus*, Ns., *Chasmodon apterus*, Ns., and the sexes of *Cleptes semiauratus*, Linn.

Mr. Billups further exhibited specimens of the following Hymenoptera bred from galls of *Cynips Kollari*:—*Cynips Kollari*, Hart., *Synergus melanopus*, Hart., *S. pallicornis*, Hart., *S. Reinhardi*, Mayr, *S. vulgaris*, Hart., *S. facialis*, Hart., *Crabro clavipes*, Linn., *Passalœcus insignis*, Lind., *Hemiteles oxyphimus*, Gr., *H. bicolorinus*, Gr., *H. areator*, Panz., *H. incisus*, Bridgm., *Thersilochus saltator*, Fabr., *T. boops*, Gr., *Chelonus submuticus*, Wesm., *Lygocerus ramicornis*, Boh.?, *Thoron fornicatus*, Ns., *Eurytoma rosæ*, Ns., *Decatoma biguttata*, Swed., *Diomorus calcaratus*, Ns., *Syntomaspis caudata*, Ns., *S. sp.*?, *Callimome regius*, Ns., *C. auratus*, Fonsc., *Megastigmus stigmaticans*, Fabr., *M. dorsalis*, Fabr., *Pteromalus fasciiventris*, Westw., *P. tibialis*, Westw., *P. spp.*?, *Eupelmus urozonus*, Dalm., *E. Degeeri*, Dalm., *Olynx gallarum*, Ns., and three or four other undetermined *Chalcididæ*.

Mr. C. O. Waterhouse exhibited a small locust (*Phaneroptera falcata*, Scop.), lately captured by Dr. Mason in Cornwall; also a living specimen of a curious dipteron—probably one of the *Tachinidæ*—which had that day emerged from a cocoon of *Megalopye citri*, Sepp, from Brazil.

The Secretary read a note from Mr. H. W. Bates, pointing out that *Broscosoma elegans*, Bates (Trans. Ent. Soc. Lond., 1883, p. 233) had been previously described as *Miscodera Donitzi* by von Harold in the Mitth. Münch. Ent. Verein, vol. v., p. 36.

Sir Sidney Saunders exhibited both sexes of a Chalcidideous insect described by Cavolini a century ago (Milan, 1782) under the name of *Ichneumon ficarius*, parasitic on *Blastophaga* in the Caprificus figs of Italy; the female generically coinciding with the *Cynips Caricæ* of Hasselquist, recently detected in such figs at Smyrna, but hitherto unknown since first recorded by him as taken there in April, 1750.

As regards the traditional adage of caprification, a new element of mystery has been imported into the discussion of the reputed absence of *Blastophagæ* in the domestic figs subjected to this process—to say nothing of a *brood* being nurtured therein—; for we are assured that, when tempted on such occasions, these creatures are unable to deposit their ova in the *right place* ("In den Fiori di Fico stechen die Thiere in der That in den Griffel ein, ohne jedoch das Ei jemals an die richtige Stelle bringen zu können."—Solms, p. 37). The cultivators, however, blindly addicted to local usage, take no trouble to enquire into these matters, fully persuaded that without the intervention of such beneficent auxiliaries they would assuredly lose their crops. Aristotle, indeed, ascribes some peculiar faculty

to the mouths of these insects (the so-called "*fermentation-theory*," according to Solms, p. 27), when stating that the Ψὴν εἰσδύεται εἰς τὰ τῶν συκῶν ἐρῖνὰ καὶ διὰ στομάτων ποιεῖ μὴ ἀποπίπτειν τὰ ἐρῖνὰ—though a large proportion of these wild figs remains untenanted, retaining their hold without such tutelary aid.

This theory, subsequently expatiated upon by other writers, and held applicable alike to the domestic figs as subject to the same laws, has culminated in a systematic disregard of facts in many of the fig-growing countries, while in some parts of the same countries and in others the practice is unknown. For certain varieties this treatment is dispensed with even at Naples (Solms, p. 25); but if in reality any such figs found favour with the *Blastophagæ* they would certainly be discarded by consumers as objectionable. Tournefort relates that the caprificated figs must be dried in an oven instead of in the sun, to destroy the brood, whereby their aroma is lost and their commercial value depreciated. But, as Count Solms remarks, "the confusion between the brood of the *Blastophagæ* and the larvæ of moths which delight in consuming the dried figs, is apparent" (*l. c.*, p. 26).

The question of specific identity must await a comparison between corresponding broods; three generations being produced in the course of a year, coinciding with the three successive crops of Caprificus figs; the aforesaid Italian female appertaining to the third brood, emerging in October, whereas the Smyrna specimens were obtained from the first and second crops of these figs in April and July.

Papers read.

Mr. W. L. Distant read a "First report on the Rhynchota collected in Japan by Mr. George Lewis." The *Pentatomidæ*, *Coreidæ*, *Lygæidæ*, and *Pyrrhocoridæ* comprised 109 species, 33 of which are described as new. Mr. Distant considered that the fauna of Japan had been largely derived from palæarctic elements, but that the number of oriental species found was very considerable.

Messrs. Gorham and Elwes both considered the Japanese fauna to be strictly palæarctic, with a tendency to the partial development of tropical or oriental forms in the south, owing to the climate. Mr. Elwes said this was specially observable in the avifauna, 71 per cent. of the birds belonging to palæarctic genera and only 16 per cent. having oriental affinities.

Mr. Lewis pointed out that most of the Hemiptera collected were captured in the southern islands, and suggested this as a probable explanation of Mr. Distant's conclusions.

Mr. H. J. Elwes read some "Further notes on the genus *Colias*," illustrating his remarks by the exhibition of numerous series of specimens.

Rev. H. S. Gorham said he quite sympathised with much that Mr. Elwes had said, remarking that the specific difficulties equally existed in the groups

of Coleoptera which he had lately been studying. He maintained that where races and varieties were found to interbreed they should be sunk as species; hybrids doubtless occurred, but they were very exceptional. He especially referred to the *Telephoridæ*, *Coccinellidæ*, and *Chrysomelidæ*, stating that in the numerous unions he had witnessed he never saw or heard of two distinct species occurring *in cop.*

With respect to this latter remark, Mr. Elwes stated that in the Vienna Museum there existed specimens of *Argynnis Lathonia* and *A. Dia* which had been captured *in cop.* by Mann.

Mr. Edward B. Poulton read some "Notes upon or suggested by the colours, markings, and protective attitudes of certain Lepidopterous larvæ and pupæ and of a phytophagous Hymenopterous larva." His remarks were illustrated by the exhibition of coloured drawings of varieties of the larvæ of various *Sphingidæ*, &c.

Mr. R. Meldola said that he would, in the first place, congratulate the Society upon having acquired a new member who had taken up a line of work so much neglected by English entomologists. He regretted that the lateness of the hour precluded the discussion of the paper with anything approaching the completeness that it merited. He would only say that in the main he agreed with most of the conclusions at which Mr. Poulton had arrived. With reference to the use of the remaining traces of the subdorsal line in the caterpillar of *Smerinthus ocellatus*, Mr. Meldola stated that the explanation offered was most ingenious, and one that he was fully prepared to accept. When working at this particular subject he had felt convinced that the residual subdorsal line which exists also in the adult larva of *Sphinx convolvuli* might in some cases be of use in aiding disguise, and he had recorded such an instance (*Chærocampa capensis*, Linn.) in the English edition of Weismann's 'Studies,' on the authority of Mr. Roland Trimen. Respecting the function of the rust-coloured spots on *Smerinthus* larvæ, he stated that Weismann's view, that these were the rudimentary beginnings of the coloured edges of the oblique stripes, was founded upon observations on *S. tiliæ* in Germany, in which species the spots sometimes run together so as to form such a coloured edge. It unfortunately happened that the ontogeny of species with pronounced coloured edges to the oblique stripes, such as *Sphinx ligustri*, had not been completely made out. By this means alone could the problem be attacked with any hope of success; and, as far as the present evidence went, Mr. Meldola was inclined to accept Mr. Cameron's view, that these spots might assist in concealing the caterpillar by representing galls or blotches on the leaves of the food-plant. The fact that the majority of individuals first acquire the ferruginous spots in the fifth stage is in favour of the view that this character is a recent one, and not an ancient one being lost. Were the latter the case the spots would invariably appear earlier in the ontogeny. The curious attitudes

assumed by the Geometer larvæ referred to by Mr. Poulton were instructive cases of the correlation of habit with protective resemblance, of which so many instances had already been recorded. In this connection, Mr. Meldola referred to the somewhat similar habit of the caterpillar of *Emmelesia unifasciata*, which loops itself up in the seed-capsules of its food-plant (*Bartsia*) in a manner well calculated to enhance its means of concealment. The case of the larva of the *Nematus* mentioned he regarded also as one of typical importance, illustrating how the internal anatomy of an insect could be modified or controlled by natural selection for the good of the species. In conclusion, Mr. Meldola suggested that as the colour and pattern on many caterpillars was still, in a large number of cases, imperfectly understood, it might help to clear up the meaning of some of these markings if experimental larvæ were modelled out of plaster-of-paris or some other materlal, and changes rung upon the colours and patterns by artistic treatment, so as to find by experiment what particular mode of ornamentation caused the model to assimilate more closely to, or to deviate more widely from, the environment. He believed that by this means many markings which in an isolated larva removed from its natural surroundings were apparently devoid of meaning, would be found to possess as decided an advantage as had been demonstrated by the author in the case of the residual subdorsal line or the apparent angularity of *Notodonta ziczac*.

Mr. J. Jenner Weir also made some remarks on the many interesting points brought out in Mr. Poulton's paper.

Dr. Franz Leuthner read the description of "*Ægognathus Waterhousei*, a new genus and species of *Dorcidæ* from Peru." He remarked on the close relationship often existing between Australian and South American genera. Mr. Waterhouse referred to two genera of *Buprestidæ* (*Stigmodera* and *Conognatha*), in which this was equally noticeable.

Mr. C. O. Waterhouse read the "Description of a new species of *Eurytrachelus* (*Dorcidæ*)" from the Solomon Islands.

December 5, 1883.

R. M'Lachlan, Esq., F.R.S., &c., Vice-President, in the chair.

Donations to the Library were announced, and thanks voted to the respective donors.

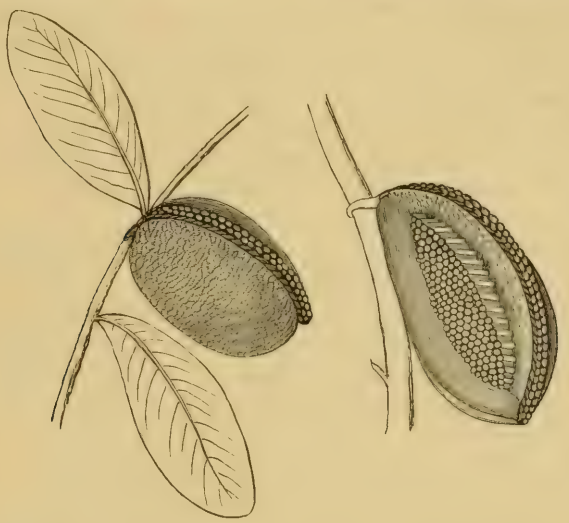
The Chairman announced the death of Dr. J. L. Leconte, of Philadelphia. He was elected an Honorary Member of the Society in 1863.

Election of a Member.

George Bowdler Buckton, Esq., F.R.S., &c. (Weycombe, Haslemere, Surrey) was balloted for and elected a Member of the Society.

Exhibitions, &c.

Mr. F. P. Pascoe exhibited some remarkable insects' nests from Delagoa Bay. They varied from half an inch to an inch and quarter in length, and in shape from globular to ovate. They were semitransparent, yellowish, and the surface, under a lens, had a reticulate appearance; on one side, from the base to the apex was a stout suture, to which was attached a septum extending about two-thirds across the interior; on each side of this septum, but away from the suture, were placed in an erect position about



120 cylindrical eggs. These nests had much the appearance of the dried pods of the "bladder senna;" they were retained by a movable loop to the slender twigs of a shrub which Sir Joseph Hooker had pronounced to be a *Rhamnus*.

Mr. R. M'Lachlan considered that these curious bladder-like egg-cases belonged to one of the *Mantidæ*.

Mr. Wood-Mason did not think they should be attributed to the *Mantidæ*, although possibly it might be so; he pointed out that the eggs were arranged in quite a different manner to those of any *Mantis* he had seen. He also suggested that the large vacant space existing between the egg mass and the outside of the capsule would probably be protective against parasitic insects.

Mr. T. R. Billups exhibited specimens of *Pachylarthrus smaragdinus*, Curt., bred on December 1st from the pupa of *Acidia heraclei*, Linn.—the celery fly.

Mr. Billups also exhibited specimens of three *Tenthredinidæ*, and made the following remarks thereon:—

Pœcilosoma Fletcheri, Cam., taken at Chertsey, May, 1882. Of this species there are only two recorded captures, one by Dr. Sharp from Braemar, and the other by Mr. Cameron at Rannoch.

Tenthredopsis inornata, Cam. This apparently rare species is only recorded as being taken once, by Mr. Bishopton, on birch, in June, at Rannoch. I have met with it several times: one male taken at Chertsey in May, 1882; one female at Headley Lane, June, this season; and two in my own garden at Peckham. I think it not unlikely this species is not so rare as Mr. Cameron imagines, but may possibly be mixed up in collections with some of the other yellow forms of *Tenthredopsis*, such as *T. nassata*, Linn., or *T. dorsivittata*, Cam., which it closely resembles.

Tenthredo Lachlaniana, Cam. This is, I believe, the first recorded female taken this side of the border, and Mr. Cameron only records its capture twice in Scotland,—once by Dr. Sharp at Rannoch, and once by himself at Braemar,—although he once found a male near Gloucester. My specimen is from Headley Lane, May, 1883.*

Mr. E. Saunders exhibited four specimens of *Athous difformis*, Lac., captured at Hastings this season by Mr. Collett.

Mr. Saunders also exhibited, on behalf of Mr. G. S. Saunders, an apparatus for showing microscopic objects, made by Baker of Holborn. It had a terminal milled wheel which would turn the object laterally, and had a peg running through the axis of the wheel which would by pressure turn the object longitudinally.

Mr. E. A. Fitch remarked that *Priocnemis Pascoei*, Kirby (Trans. Ent. Soc. Lond., 1883, p. 200; fig. Waterhouse's 'Aid,' pl. 137, fig. 7), is a variety of *Ichneumon lotatorius*, Fabr. (Ent. Syst., ii., 141). He had compared the type specimen of Mr. Kirby's species with the type of Fabricius' *I. lotatarius* from New Zealand, still in the Banksian cabinet, and with seven other specimens, also from New Zealand, in the National Collection, and had no doubt of their identity, although the species was somewhat variable.

The Secretary read a communication from Prof. Thiselton Dyer, of the Royal Gardens, Kew, with reference to the supposed occurrence of *Phylloxera vastatrix* upon vines in the colony of Victoria; also a communication from the Premier's Office, Melbourne, enclosed, and exhibited two bottles containing specimens of vine-roots therewith transmitted.

Mr. L. de Nicéville communicated a "Note on the *Papilio polydecta* of Cramer," having reference to the correct identification of Cramer's species. He pointed out that *Mycalesis polydecta*, Butler (Ann. Mag., Nat. Hist. (3),

* [There is a specimen from Munich in the British Museum.—W. F. K.]

xx., 402), and the varieties of *M. polydecta*, as identified by Mr. Moore (see Butt. of India, p. 119), are but local varieties of *M. mineus*, Linn., as pointed out by Mr. Distant in 'Rhopalocera Malayana,' p. 51.

Papers read.

Mr. W. H. Miskin communicated "Descriptions of new Australian Rhopalocera," comprising a *Delias*, an *Atella*, a *Hypochrysops*, a *Pseudodipsas*, and a *Deudorix*. Also a "Note on *Tachyris melania* of Fabricius," holding that *T. Clementina*, Felder, is the male of Fabricius' species, whose type is a female. Mr. Miskin possessed specimens of the sexes, captured together at Cape York.

Mr. E. Meyrick read a memoir "On the classification of Australian Pyralidina." The families *Epipaschiadæ* and *Pyralididæ* were divided into fifteen genera, including twenty-four species; two of the genera (*Aglossa* and *Asopia*) were supposed to be introduced from Europe, and nine others to be endemic. Mr. Meyrick supposed that *A. cuprealis*, Hüb., had been introduced from Europe with wheat, in the same way that *Sitotroga cerealella*, Oliv., had been introduced from America with maize. In reply to the Chairman, who stated that he had only taken *A. cuprealis* at sugar on oak-trunks, Mr. Meyrick said that he had not bred *A. cuprealis*.

Mr. G. T. Porritt remarked that he had larvæ of this species now feeding on stable refuse, straw, &c., and that they had continued feeding for the last eighteen months, as had some in Mr. Buckler's possession.

Mr. E. A. Fitch said he had taken *A. cuprealis* in numbers on the inside walls of a thatched stable in Suffolk.

New Part of 'Transactions.'

Part IV. of the 'Transactions' for 1883 was on the table.

ANNUAL MEETING,

January 16, 1884.

J. W. Dunning, Esq., M.A., F.L.S., &c., President, in the chair.

An abstract of the Treasurer's accounts for 1883 was read by Mr. J. Jenner Weir, one of the Auditors.

The Secretary read the following:—

Report of the Council for 1883.

In accordance with the Bye-Laws, the Council begs to present the following Report:—

During the year 1883 the Society has elected seventeen new Members

and one Subscriber; it has lost four Members by death (Messrs. B. Cooke, W. A. Forbes, P. H. Harper, and E. Sheppard), and three by resignation.

To the regret of all entomologists, two names which have long graced our list of Honorary Members must be erased. Professor P. C. Zeller, who was elected an Honorary Member as long ago as 7th May, 1849, died suddenly at his residence near Stettin on March 27th last, and Dr. John L. Leconte, elected an Honorary Member on April 6th, 1863, died at Philadelphia on November 15th. To fill the vacancies thus created two names will be submitted to you at an early meeting.

The way in which the proposal that Professor Westwood should be made Honorary President for life was received is known to you all. This act formed a fitting celebration of the fiftieth anniversary of our foundation.

The Transactions for the year (exclusive of the Proceedings) form a volume of 448 pages, containing twenty-two memoirs contributed by eighteen authors; they are illustrated with twenty-one plates, two of which are coloured. The members have to thank Mr. Lewis for presenting the map and two plates (xiii. and xiv.) which appeared in part iii., and the Rev. H. S. Gorham for defraying the cost of colouring plate xvii.

The fifty-six pages of Proceedings contain many interesting records, but it is still to be regretted that the Members generally do not more frequently bring exhibitions to the meetings, both to give and often to receive information. It is likely that the commodious and handsome new meeting-room will attract a larger attendance; this has already been visible during the latter part of the past year, and it is to be hoped that Members will individually endeavour to make the monthly meetings more interesting to everyone.

The following is an abstract of the Treasurer's accounts:—

Receipts.		Payments.	
Balance in hand - - -	£1	Rent, Office, and Meeting Expenses - - -	£118
Contributions of Members -	260	Publications - - - -	255
Sale of Publications - -	103	Library - - - - -	56
Interest on Consols - -	9		
Donations - - - -	60		
	£433		£429

It thus again happens that owing to the amount received in donations the payments are covered by the receipts, leaving a small balance in hand.

The Library has been increased during the year by the usual serials and a few other purchases, and by many donations from members and others; a special vote of thanks has been accorded to our President for his munificent gift of a complete set of the Annals and Magazine of Natural

History as far as published, to Vol. XII. of the 5th Series; in all ninety-two volumes.

The Library has been more frequently consulted, and more volumes have been borrowed than could have been expected, considering the inconveniences occasioned by the alterations and the inaccessibility of many of the books.

The Bye-Laws have been revised to the following effect:—that no more Annual Subscribers or Corresponding Members shall be elected; that every contributing Member upon payment of the subscription shall be entitled to the volume of the Transactions for the year as published; and that no Member shall be elected into the Council or as an officer unless previously nominated.

We have changed our rooms, but not their locality. The Medical Society have greatly enlarged and partially rebuilt their premises, and in the general improvements made we have participated; our new Library is a larger, better-lighted, and more convenient room than previously, and the new meeting-room must have been very favourably compared with the old by us all. As last year, the special thanks of the Society are again due to Mr. Grut and Mr. Poole for discharging the extra labours cast upon them by the removal and in the re-arrangement of the new rooms. These alterations have necessitated the purchase of new cupboards to contain our large stock of Transactions, but the annual charges on the Society will be the same as heretofore. Three Life-compositions received during the year have been expended upon the Library.

To give Members an opportunity of becoming better acquainted with the earlier volumes of our Transactions, and with a view to reduce our stock, the Council has thought well to reduce the price to Members of the volumes published previously to 1878, the first series (of which only a few copies of the first four volumes remain in stock) excepted. It is hoped that advantage will be taken of this reduction.

The work done by the Society in the fiftieth year of its existence compares favourably with that of any other, and it is to be hoped that present members will use their best efforts to support the Society, to secure additions to our Library, to the list of Members, and to the general fund of entomological knowledge, that all may participate in the good work done.

11, Chandos Street, Cavendish Square,
16th January, 1884.

No Members having been proposed other than those recommended by the Council, the following were declared to be the Members of Council for 1884:—T. R. Billups, J. W. Dunning, E. A. Fitch, F. Grut, W. F. Kirby, G. Lewis, R. M'Lachlan, J. W. May, R. Meldola, F. P. Pascoe, E. Saunders, Sir S. S. Saunders, J. W. Slater.

The following officers were declared to be re-elected:—*President*, J. W. Dunning, M.A., F.L.S., &c.; *Treasurer*, E. Saunders, F.L.S.; *Secretaries*, E. A. Fitch, F.L.S., and W. F. Kirby; *Librarian*, F. Grut, F.L.S.

The President then delivered an address, at the conclusion of which Mr. H. T. Stainton proposed a cordial vote of thanks to Mr. Dunning for his services as President during the year, and requested that he would allow his address to be printed with the 'Proceedings.' The proposal was seconded by the Rev. H. S. Gorham, and carried unanimously.

Mr. R. M'Lachlan proposed a vote of thanks to the Secretaries, Librarian, and Treasurer, which was seconded by Mr. J. W. Slater, and carried unanimously.

Messrs. Saunders, Fitch, and Grut made some remarks in acknowledgment.

ABSTRACT OF RECEIPTS AND PAYMENTS FOR 1883.

Receipts.	£	s.	d.	Payments.	£	s.	d.
To Balance, 1 Jan. 1883	0	18	9	By Rent, Salary of Sub-Librarian, and Office Expenses	160	10	6
Subscriptions, 1883	171	15	0	Printing, &c.	179	2	7
Arrears	11	11	0	Colouring, Plates, &c.	76	1	2
Admission Fees	29	8	0	Books, Binding, &c.	13	14	6
Compositions	47	5	0				
'Transactions'	102	15	11				
Donations	60	12	0				
Dividend on £313 4*s.* 8*d.*	9	2	10	Balance	3	19	9
	£433	8	6		£433	8	6

LIABILITIES.

(None.)

ASSETS.

	£	s.	d.
Balance	3	19	9
Subscriptions due, considered good	6	6	0
Consols, £313 4*s.* 8*d.* (cost)	293	4	0
	£303	9	9

Audited and found correct.

J. Jenner Weir.
J. W. Slater.
R. M'Lachlan.
Geo. C. Champion.

January 9th, 1884.

THE PRESIDENT'S ADDRESS.

Gentlemen,

Our Jubilee has come and gone, and if we have not made the trumpet of the jubilee to sound throughout all the land, it is because, in disregarding the ancient command, "Ye shall not sow, neither reap, nor gather the grapes in it," we recognise a more perfect way of hallowing the fiftieth year, by quietly continuing our labours. There is no sabbatical year for Science; no year of rest for its votaries.

The full Report of the Council renders it unnecessary for me to refer to many of our internal affairs. The recent building alterations necessarily caused inconvenience during their progress, but the result has been to give us the use of this admirable Meeting Room, whilst our Library accommodation has been both increased and improved. The removal and re-arrangement of the Library have thrown much additional work upon the Librarian's shoulders; and as the mouthpiece of the Society I beg to offer our hearty thanks to Mr. Grut for his invaluable services. But that I know there is no limit to the labour he is willing to undertake, or the time he places at our disposal, I should hesitate to remind you that the next thing to be done is, to compile a new Catalogue of the Library, and then to print it.

We have lost, by death, six of our colleagues:—

Benjamin Cooke, a well-known Lancashire entomologist, was born the 16th September, 1816, and died suddenly at Southport on the 4th February, 1883. He was for several years President of the Northern Entomological Society, afterwards Vice-President of the Lancashire and Cheshire Entomological Society, and for the last eighteen years he had been one of our Members, though I cannot recall an instance of his having attended any of our meetings. His published writings are few; too few, for he was

a careful observer, and full of information. His best known paper, on the Classification of Insects, was printed in 'The Zoologist' for 1858 (see pp. 5951, 6079); he returned to the subject in 1882, in a paper read before the Lancashire and Cheshire Society; and in the 'Proceedings' of the same body he had recently published a Catalogue of the Hymenoptera and Diptera of those counties.

William Alexander Forbes was born at Cheltenham on the 24th June, 1855; after going through the usual course at Winchester, and studying for a time in Germany and in Edinburgh, he went to Cambridge, took a first class in the Natural Sciences Tripos, obtaining special distinction in Zoology and Comparative Anatomy, and was elected to a Fellowship at St. John's College. Shortly afterwards he was appointed Prosector to the Zoological Society of London, and from that time his attention was diverted from Entomology to Comparative Anatomy, particularly of birds. In 1880 and 1881 he visited South and North America; and in July, 1882, he left England for a scientific journey into Africa, but died from dysentery at Shonga, on the Niger, on the 14th January, 1883. His early death is a great loss to zoological science, to which he had already made important contributions, and his scientific papers will shortly be published in the form of a memorial volume under the auspices of a Committee of the Zoological Club.

Philip Henry Harper, F.R.C.S., died at his residence in Cambridge Street, Hyde Park, on the 29th November, 1883, at the age of sixty-one years. He had been a member of our Society for nearly twenty years, though he seldom attended our meetings. He was an ardent collector of British Lepidoptera, and his cabinet was rich in varieties and aberrant forms. I am not aware that he ever published anything entomological.

Edward Sheppard died at his residence in Durham Villas, Kensington, on the 8th September, 1883, in his sixty-eighth year; he had only two months before retired from the office of Collector of Customs for the Port of London. Formerly he studied Coleoptera, especially the *Chrysomelidæ* and *Erotylidæ;* and though of late years his entomological ardour relaxed, his presence at our gatherings, commencing in 1852, was continued to the last. His geniality and kindly disposition will long be remembered amongst us.

John Lawrence Leconte was born in New York on the 13th May, 1825,* his father (himself an entomologist) being a Major in the Army of the United States. He was educated at St. Mary's College, Maryland, and in 1846 passed the College of Physicians and Surgeons in New York. In 1852 the family removed to Philadelphia. During the Civil War he entered the Army Medical Corps as Surgeon of Volunteers, and was promoted to the grade of Medical Inspector with the rank of Lieutenant-Colonel, in which capacity he served until after the close of the war in 1865. Latterly he held an appointment in the Mint at Philadelphia. In 1863 he was elected an Honorary Member of this Society. He was President of the American Association for the Advancement of Science in 1874, and at the time of his death he was President of the American Entomological Society. Some few years ago (1869—72) Dr. Leconte paid a long visit to Europe, and was well known to most of our leading Coleopterists. His earliest papers date from 1844, and in his time he characterised some 500 genera and 5000 species of North American Coleoptera; but he was not a mere species-maker or describer, it was as a writer on the classification of the Order that he won his fame. His published papers, nearly two hundred in number, and nearly all on American Coleoptera, are scattered over the publications of the Natural History Societies of Philadelphia, Boston, and New York, the American Association for the Advancement of Science, the American Philosophical Society, the Smithsonian Institution, the Transactions of the American Entomological Society, and the Canadian Entomologist. A few notes of his will be found in our own 'Annals and Magazine of Natural History'; and a paper "On *Platypsyllidæ*, a new Family of Coleoptera" appeared in the Proceedings of the Zoological Society of London for 1872 (p. 799). In 1859 he edited the entomological works of Thomas Say; and but a few months before his death, in conjunction with Dr. Horn, he published a 'Classification of the Coleoptera of North America,' being an amplification and completion of the work originally produced in 1861—2, and which may be taken to exhibit the mature views of

* This date is said to be doubtful. Dr. Sharp states (Ent. Mo. Mag. xx. 192) that Leconte at his death was about sixty-six years of age. But Dr. Horn gives the date as above ('Science,' ii. 783).

Leconte, the results of his forty years' study of that group. He was emphatically *the* authority on American Coleoptera; and his death, which occurred on the 15th November, 1883, leaves a blank which his countrymen will find it difficult to fill. His collection will have a fitting resting-place in the Museum at Cambridge, Massachusetts.

Philipp Christoph Zeller was born at Steinheim-on-the-Murr, in Würtemberg, on the 9th April, 1808, but in his infancy he was taken to Frankfort-on-the-Oder, where in very early youth he appears to have acquired a love for Lepidoptera; at the age of fifteen he began to keep a lepidopterological journal, but it was not until he went to the University of Berlin that he had any instruction in Natural History. Having graduated at Berlin, he returned to Frankfort-on-the-Oder in 1830, and began to devote his leisure to Botany and Entomology, his chief attention being at this time given to Coleoptera and Diptera, to the writers on which Orders, and especially to the dipterologist Meigen, Zeller was wont to attribute any benefit which he derived from the study of other entomological authors. But in 1833 he made the acquaintance of Fischer von Röslerstamm, and resumed the Lepidoptera as his favourite group. Having married, and adopted tuition as his profession, we find him in 1835 Oberlehrer at the Town School of Gross-Glogau, in Silesia, and in 1852 his educational services were specially recognised by the King of Prussia conferring upon him the title of Professor; in 1860 he removed to Meseritz, in Posen, where he continued his professorial duties until 1866, when he retired on a government pension; from 1869 till his death he lived near Stettin, and died suddenly at Grünhof on the 27th March, 1883. His collection has been purchased by Lord Walsingham.

The editor of Oken's 'Isis' had offered a prize for the best essay on the determination of the Lepidoptera mentioned in Réaumur's 'Mémoires'; and the prize was awarded to Zeller, whose "Kritische Bestimmung der in Réaumur's Memoiren vorkommenden Lepidopteren" was published in the 'Isis' for 1838; and in the volume of the same work for the following year appeared the "Versuch einer naturgemässen Eintheilung der Schaben," which by its masterly treatment of the *Crambina* and *Tineina* at once stamped its author as a man of mark. His contributions to the 'Isis' continued until the cessation of that publication in the troublous days

of 1848. In the meantime the Entomological Society of Stettin had been founded, and from 1840 onwards Zeller was a constant writer in the 'Stettiner Entomologische Zeitung'; in 1846 the same society commenced the publication of the 'Linnæa Entomologica,' and the first volume of this contained the monographs of *Lithocolletis* and *Eudorea*, which may be said to have introduced Zeller to the knowledge of English entomologists. (How well I remember that, at the suggestion of Mr. Stainton, my immediate predecessor in this chair, I procured the volume; and how well I recollect that—a schoolboy at the time, and with the kindly aid of Mr. Peter Inchbald, happily still one of our Life Members—I received out of the 'Linnæa' my first lessons alike in German and in Micro-Lepidopterology! From that day to this I have had an affection for *Lithocolletis* that I never had for any other genus. But pardon this digression!) The successive volumes of the 'Linnæa' down to 1855 contained other memoirs from Zeller's pen, the last being an elaborate treatise on the genus *Butalis*. In the same year was commenced the quadrilingual 'Natural History of the Tineina' (13 vols., 1855—73), the German and Latin letterpress of which were translated by Zeller from the English, and no one more readily than Mr. Stainton will acknowledge the value of his collaboration. In 1863 he wrote the Monograph of the *Chilonidæ* and *Crambidæ;* and in 1867 appeared two short papers, one on the *Crambina*, *Pterophorina* and *Alucitina* collected in Palestine, and the other on the *Choreutidæ* and *Crambina* collected in Egypt, by the Rev. O. P. Cambridge, being the only papers of Zeller's which were published in our own Transactions (Trans. Ent. Soc. Lond., 3rd series, vol. v., pp. 453, 461). In 1872, 1873, and 1875 the "Beiträge zur Kenntniss der nordamericanischen Nachtfalter, besonders der Microlepidopteren" appeared in the Verhandlungen der k.-k. zool.-botan. Gesellschaft in Wien; and in 1877 and 1881 some valuable papers on Exotic Micro-Lepidoptera were published in the Horæ Soc. Entom. Rossicæ. Meanwhile his contributions to the Stettin Zeitung continued uninterruptedly, the duties of Librarian to the Stettin Society were congenial to his tastes, and his very last act was to correct a proof-sheet of the Zeitung: the ink was scarcely dry when he was found dead on his study floor.

Thus died in harness one whose long and peaceful but active

life was wholly given to science. He was chosen an Honorary Member of our body in 1849; three years later he came to England, and, though he never repeated the visit, his name has been a household word, and he was, as it were, a living presence amongst us. He published a few papers on Diptera between 1840 and 1847, but it is as a lepidopterist that his fame will live. "Prof. Zeller is the father of the present race of Micro-lepidopterists; Micro-Lepidopterology as now pursued may be said to date from the appearance in the 'Isis' of 1839 of the Attempt at a natural arrangement of the smaller moths." Thus was it written a quarter of a century ago; now that he has gone, the encomium may be repeated, and we can speak of him with greater warmth than was permissible of a living author. Venerable in appearance, courteous, gentle and charitable, tolerant of the views and indulgent to the failings of others, learned yet no pedant, an enthusiast in his favourite pursuit, as every man ought to be, he was devoted to science for science' sake. Careful and discriminating in his observations, accurate, lucid and precise in his language and descriptions, his writings are models for imitation. He was emphatically a professor and a naturalist, a typical German, of the best Teutonic type. If he was old-fashioned in his views, it must be remembered that he belonged to an ante-Darwinian age; it was his misfortune, rather than his fault, that he was born too soon for the modern biological theories, or for the full appreciation of what, in the words of the poet-peer, may be called "the fairy tales of Science and the long results of Time." But when all is said, we have lost in Zeller a gentleman and a scholar, who well earned the distinction of a Past Grand Master of Entomology.

There are now two vacancies in our Honorary List. And I invite the suggestion of names worthy to replace those of the American coleopterist and the German lepidopterist, whose name and fame will live, but to whom as colleagues nothing remains for us but to say Farewell.

Extending our gaze beyond the narrow circle of ourselves, we have also to regret the death of the Rev. H. Harpur Crewe, so well known for his intimate acquaintance with the British *Eupithecia*; of William Buckler, the artistic delineator of the larvæ and writer of life-histories of so many of our indigenous

Lepidoptera;* of Vincent T. Chambers, the American lepidopterist; of Prof. Townend Glover, Entomologist of the Department of Agriculture at Washington; of Oberforstmeister Tischbein, the German hymenopterist; of Gustav Flor, Professor of Zoology at Dorpat, and author of the 'Rhynchoten Livlands' (1860—61); of Oswald Heer, Professor of Natural History at Zürich, author of the 'Fauna Coleopterorum Helvetica' (1838—42), and numerous papers on fossil insects; of Dr. Wilhelm Carl Hartwig Peters, Director of the Zoological Museum at Berlin, author of the 'Naturwissenschaftliche Reise nach Mossambique' (vol. 2, Insecta and Myriopoda, 1862); and of Dr. Hermann Müller, of Lippstadt, whose investigations on the fertilization of flowers by insect-agency opened a new field and presented new charms to entomologists. Originally published at Leipsic in 1873, 'Die Befruchtung der Blumen durch Insekten und die gegenseitigen Anpassungen beider; ein Beitrag zur Erkenntniss des ursächlichen Zusammenhanges in der organischen Natur' has recently appeared in English, prefaced by one of Charles Darwin's latest writings:—

"Any young observer who, after reading the whole or part of the present work, will look, for instance, at the flower of a *Salvia*, or of some papilionaceous or fumariaceous plant, or at one of our common Orchids, will be delighted at the perfection of the adaptations by which insects are forced, unconsciously on their part, to carry pollen from the stamens of one plant to the stigma of another. Design in Nature has for a long time deeply interested many men, and though the subject must now be looked at from a somewhat different point of view to what was formerly the case, it is not thus rendered the less interesting." And then he goes on to indicate how much there is yet to be added to the work already done, fresh work which "will occur in abundance to any young and ardent observer who will study Müller's volume and then observe for himself, giving full play to his imagination, but rigidly checking it by testing each notion experimentally. If he will act in this manner, he will, if I may judge from my own experience, receive so much pleasure from his work that he will

* Mr. Buckler died on the 9th January, 1884, at the age of sixty-nine years; a description by him of the larva of *Apamea fibrosa* appeared in the January number of the 'Entomologist's Monthly Magazine' (vol. xx., p. 176). He leaves behind him a long series of drawings of larvæ, &c., which are simply magnificent and unrivalled.

ever afterwards feel grateful to both the author and translator of the 'Befruchtung der Blumen.'"

His death, after three days' illness and at a comparatively early age, has been a sad loss to his family; and a Committee has been formed, including some of the best known biologists of Germany, to raise a fund the annual proceeds of which will be given to his widow for life, and on her death shall form a prize fund, to bear Hermann Müller's name, in connexion with the Public School of Lippstadt.

Of the eighteen authors who have written the twenty-two memoirs of varied interest which constitute our annual volume of 'Transactions,' I am glad to say that four are new contributors. The papers are distributed amongst the Orders of insects as follows:—nine on Coleoptera, eight on Hymenoptera, four on Lepidoptera, and one on Hemiptera. Three only relate to British Entomology, and all these to the Hymenoptera. The splendid collections brought home by Mr. George Lewis have given an impetus to the study of the insect fauna of Japan; and the papers of Messrs. Bates, Sharp, Lewis, and Gorham on the Coleoptera, and of Mr. Distant on the Rhynchota, make Japanese Entomology one of the leading features of our volume for 1883.

In addition to this, the Proceedings of the Zoological Society and the Journal of the Linnean Society contain nearly a score of entomological papers, most of which are by members of this Society, whilst our colleague Mr. P. H. Gosse has monopolised a whole part of the Linnean Transactions with his memoir "On the clasping-organs ancillary to generation in certain groups of the Lepidoptera." The author describes and figures in detail the armature of sixty-nine species of *Ornithoptera* and *Papilio;* and in a note at the end he adds, that at the time of going to press he had in MS. descriptions with drawings of the genitalia of fifty-six additional species belonging to the genera *Ornithoptera*, *Papilio*, *Teinopalpus*, *Sericinus*, and *Leptocircus*.

"Nothing (says Mr. Gosse) unless it be the exquisite beauty of the workmanship, is so astounding as the variety in form and detail presented by these hidden instruments. Out of the number that I have examined, I have not found any two species whose apparatus is alike, or even so nearly alike that a moment's observation is not sufficient to show the difference." . . . . . .

"It might seem that by the aid of organs so uniformly present, so easily examined, and so varied in different species while constant in the same, great facilities must be afforded for the determination of specific identity and limitation. Yet, in practice, I fear this cannot be carried out, without severing species which otherwise seem most closely allied, and linking others which have little else in common. Look, for instance, at the three African species, *Papilio Bromius*, *P. Nireus*, and *P. Phorcas*; how consimilar are these in their forms, colours, and markings! yet how diverse in their whole prehensile apparatus! The shape of the valve, its fringing; the shape of the harpe, its armature; the uncus; the teeth of the scaphium; and finally the penis;—all these differ signally in one from their conditions in the others. The like terms might be employed concerning *P. Demoleus* and *P. Erithonius*."

"If it be asked, What is the definite purpose, in the economy of the creature, of this extreme variation? I am obliged to answer, I do not know. That, viewed in the large, the object of all these organs that crowd around the termination of the male abdomen is the firm grasp and sustained retention of the female abdomen, in the delicate and most essentially important function of reproduction, is sufficiently evident. But why the diversity of detail? Why would not one good and adequate form suffice, again, and again, and again, subject to no more variation than are the antennæ, for example, or the tarsi? It naturally occurred to me, very early in these researches, that every peculiarity in the prehensile organs of the male would have a corresponding peculiarity in that part of the female body which they were formed to grasp: and I eagerly turned to the examination of the female abdomen. But the repeated search left, and still leaves, my question—cui bono?—without an answer."

The question may be asked, says Mr. Gosse, "What homology (or analogy?) exists between the organs herein described by me and those of the Trichoptera described by Mr. M'Lachlan. I have examined every figure in his great work, and confess that I know not how to institute any satisfactory comparison with those parts in *Papilio*. It is just possible that the 'dorsal process,' in such forms as *Rhyacophila*, may be equivalent to my 'uncus'; but of 'scaphium' I see not a trace. Possibly, too, the 'inferior

appendages,' so largely developed in the same genus, may represent the 'valves'; but the resemblance is most evanescent. The penis seems formed on a plan wholly different."

A propos of the question, whether *Acentropus* belongs to the Lepidoptera or the Trichoptera, it is interesting to me to find that, referring to Mr. M'Lachlan's paper "On the external sexual apparatus of the males of the genus *Acentropus*" (Trans. Ent. Soc. Lond., 1872, p. 157), Mr. Gosse says, "Looking at his figures, I should have been inclined to say, if I had not been told, that they represented the parts of some *Papilio* or *Pieris*."

The memoir closes with these words—"Entomologists could scarcely render me a kinder or more grateful service than by sending me examples of male *Papiliones*, however torn in the wings, or even the separated abdomens if duly authenticated, of which they may possess worthless duplicates." I quote this in the hope that some of my hearers may be able to render this kind and grateful service to our distinguised colleague, and thereby aid him in the completion of the task upon which he has entered with such enthusiasm.

But Mr. Gosse is not the only one of our members who has monopolised a part of the Linnean Transactions; a whole volume is to be devoted to the Rev. Mr. Eaton's "Revisional Monograph of recent *Ephemeridæ* or Mayflies," the first portion of which, with twenty-four plates of details, appeared as the year expired. Thirteen years have elapsed since Mr. Eaton's former "Monograph on the *Ephemeridæ*" was published (Trans. Ent. Soc. Lond., 1871, p. 1), and though many points in the classification which were formerly doubtful have now been elucidated, the additional knowledge gained since 1871 has not necessitated any material departure from the sequence of the genera, or disturbed the scheme as a whole. The memoir when complete will eclipse all that has been hitherto written on this group, and form a clear resting-place in the history of the Mayflies, behind which few will care or need to grope.

Entomologists owe a fresh debt of gratitude to the Ray Society for the publication of Mr. Buckton's "Monograph of the British *Aphides*," with its 144 plates, all drawn and lithographed by the author himself, the fourth and concluding volume of which appeared in 1883. Dividing the *Aphididæ* into six tribes, containing thirty genera, the author has described and figured

182 species; the volume now under consideration including part of the *Pemphiginæ*, the *Chermesinæ*, and the *Rhizobiinæ*. There is also a chapter on *Aphides* in their economical relations to Ants; elaborate treatises on the reproduction of *Aphides*, and on their biology and morphology; notes on the antiquity of the Hemiptera, particularly with regard to *Aphides* as represented in the sedimentary rocks and in amber; observations on the natural and artificial checks to the increase of the creatures, on the mounting of specimens for the microscope and preservation for the museum; and lastly a bibliographical list of authors who have treated of the life-history or anatomy of the group.

According to M. Lichtenstein, the evolution of plant-lice is entirely different from the common metamorphosis of other insects, and may be compared to the growth of a plant. The egg does not produce a male or female insect, but an agamous form, which by a sort of budding process reproduces numbers of individuals which are able to continue this budding reproduction for a more or less prolonged period, until there arrives a time at which the produce of these gemmations no longer consists of agamic, but of sexuate insects, male and female, which last lays the fecundated egg and gives origin to a new series of beings. M. Lichtenstein proposes for the agamous forms the name of Pseudogyna; and considering them to be only transitory or larval forms, he calls the four stages preceding the appearance of the sexed insects *pseudogyna fundatrix*, *migrans*, *gemmans*, and *pupifera*—*fundatrix*, the foundress of the colony, the first form issuing from the fecundated egg, the form which generally causes the galls in those species which produce galls; *migrans*, the second or winged form which flies away from its birthplace; *gemmans*, the third form of budding reproduction, without access of the male; and *pupifera*, the fourth form, which produces the sexed insects.

M. Lichtenstein's terms are not happily chosen; it is startling enough to talk of the winged migrant form as a larva, but it is confusing, or worse, to speak of another form of pseudogyne as carrying a pupa inside her, and describe her as laying pupæ, not eggs. Yet this is M. Lichtenstein's view; for he avows that by the word "pupifera" he wished to establish that it is not an egg, but a true pupa or chrysalis, that is produced by his fourth form—a view which is controverted by Balbiani, Riley,

and Buckton alike. I regret that Mr. Buckton has adopted M. Lichtenstein's names at all, even though he has been careful to explain that where he has used the words "emigrant" and "pupifer" he has done so simply for the purpose of distinguishing the first alate brood, which wanders from one tree to another of the same kind, from the second alate brood, which generally produces the true sexes. Of the sexuate forms, the females seem always to be apterous, whilst the males occur with or without wings, even in the same species.

Amongst the tribe *Chermesinæ*, Mr. Buckton retains *Phylloxera*,* a genus founded by Boyer de Fonscolombe for the reception of *Aphis quercus*, a species indigenous to Britain, and now notorious by reason of the devastation committed by the vine-pest *P. vastatrix*, which is included in the monograph as having become naturalised in this country. MM. Lichtenstein and Targioni-Tozzetti, however, propose to sever this group, not only from the *Chermesinæ*, but from the *Aphididæ* altogether; and it seems probable that future systematists will give the *Phylloxeridæ* familiar rank. They are distinguished from all Aphides by their three-jointed antennæ; and not the least remarkable of their peculiarities in the existence of aërial and subterranean habits (the *gallicola* and *radicicola* of Riley) combined in the same individual.

According to M. Lichtenstein, who has supplied Mr. Buckton with an interesting "Summary on the genus *Phylloxera*," the cycle of life in *P. vastatrix* is as follows:—

There is but one generation in the year, thus—

1. The egg, deposited under the bark of the vine, in the autumn.
2. The pseudogyna fundatrix, forming galls on the leaves, in May and June.†

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* The popular pronunciation *Phylloxĕra* is wrong: of course it should be *Phylloxēra*, the penultimate being long.

† This gall-making form is the *Peritymbia* of Westwood, though Mr. Buckton (Monog. Aphid. iv. 54) states that Prof. Westwood was only acquainted with the root-living state; a mistake which is corrected by M. Lichtenstein (*ib.* 69). Prof. Westwood's communication to the Ashmolean Society of Oxford, which was accompanied by highly magnified drawings of the leaf-insect, was never published by that Society; but the substance of it will be found in the 'Gardeners' Chronicle' for 1869: see pp. 109, 689.

3. The pseudogyna migrans, issuing from the galls and descending to the roots, in July.
4. The pseudogyna gemmans, feeding on the large roots, in August.
5. The pseudogyna pupifera, feeding on the small roots where they form blebs or swellings. These insects pass into nymphs, then issue from the soil and on the surface develop wings, in September. They fly to the vines, to deposit their eggs (pseudova, or, as Lichtenstein would say, pupas) under the leaves or in the fissures of the bark.
6. From these the sexed forms appear. After union, the female goes under the bark, where she lays a single egg, and dies in October.

Each of the four pseudogynous or agamous stages is separated from the following one by an egg-like quiescent state, so that the pseudogynes, which in other Aphides are viviparous, are in the *Phylloxeridæ* oviparous.

The first stages of *P. vastatrix* are all wingless, the so-called pupifer only being winged. This last form alone produces the males and females, which are exceedingly small and absolutely mouthless, living only for reproduction, the female laying her egg about the fourth day after she is hatched. The foundress punctures the leaves in such a manner that the swelling masses close over and finally entomb her; the leaves become studded with gall-like excrescences, each foundress forming a single gall, within which she lays hundreds or even thousands of eggs: after developing on the leaf and escaping from the gall, the young *Phylloxera* descends into the ground and commences its subterranean existence, attacking the roots of the vines and causing swellings or tubercles thereon; so numerous are the creatures that the roots when turned up often appear dusted with yellow grains.

The first notice of the Vine-Aphis is by Asa Fitch in 1855 (the grape-leaf louse, *Pemphigus vitifolii*) in his 'First Report on the Noxious, Beneficial and other Insects of the State of New York': it is not indigenous to Britain, but in 1863 it had been introduced into England, and was named by Westwood *Peritymbia vitisana;* shortly afterwards it invaded France, and has spread

over a large portion of the wine-growing districts of that country, whilst Germany and Switzerland have not escaped. In America the aërial form produces most injury; but in Europe the greatest destruction has been caused by the subterranean form. The offer of a prize of 300,000 francs has hitherto failed to discover a real remedy for the evil, which was said in 1881 to have inflicted on the French wine-growers alone a loss of three milliards of francs.

The area devoted to the growth of the vine in France has diminished since 1873 by 350,000 hectares; but the yield of the vintage for 1883 amounted to over thirty-six millions of hectolitres, being the largest in France since 1878; and it is satisfactory to learn that not only the Departments of the Loire, the Var, the Bouches-du-Rhône, the Drome, the Ardeche, Lozère, Hérault, and Ariege, but also the Vienne, and especially the Gironde, are now more or less on the way to recovery from the ravages of *Phylloxera*.

It will be remembered that in 1881 a Committee of this Society was appointed to consider and report on the evidence taken by the Legislative Assembly of Victoria as to the occurrence of *Phylloxera vastatrix* in that colony (Proceedings, 1881, p. ix.). The evidence was then deemed inconclusive (see the Report, *ib.*, p. xi.),* and the Committee recommended that specimens of the supposed *Phylloxera*, together with young rootlets of vines supposed to be attacked, should be forwarded to the Society for examination. This suggestion has been acted upon by the Victorian Minister of Agriculture, and some vine-roots have been sent for inspection, accompanied by a letter from the Premier, dated Melbourne, 24th September, 1883, in which he states "that all vines supposed to be infected with the disease in question have been dug up and destroyed, and the samples now forwarded are roots not removed from the ground at the time of digging out the vines. The insects now forwarded are in the first stage of development after the egg. Specimens of a further stage (obtainable in December or January) will be forwarded

* Mr. Buckton (Mon. Aphid. iv. 53, 56) speaks of the appearance of *Phylloxera* at the Cape of Good Hope, and in Australia; as to the latter, this is unfortunately verified; but as to the Cape Colony, is there any evidence of its occurrence there? In 1881 a sum of £25,000 was contributed by the Authorities of New South Wales, Victoria, and South Australia, to be employed in the extermination of the insect.

later on." Sir Joseph Hooker transmitted the vine-roots to this Society, and they have been examined by the Committee, who will report thereon, probably to our next Meeting. By the courtesy of Messrs. M'Lachlan and Fitch, I am able to announce the result; all doubt has been removed, the *Phylloxera* having been unmistakeably found on the roots in considerable numbers, most of them being very small, but a few being more than half-grown.

Messrs. Godman and Salvin's splendid work, 'Biologia Centrali-Americana,' has continued to appear with commendable regularity, the 27th zoological part having been published in December. The entomological portion already comprises large instalments of Lepidoptera, Coleoptera, and Rhynchota, and a beginning has been made of the Hymenoptera. As Mr. Champion alone obtained about 15,000 species of insects during his four years' residence in Central America, there will be no lack of material, whilst the execution of the work leaves nothing to be desired.

Miss E. A. Ormerod continues her useful labours in collecting information about noxious insects, and disseminating it amongst agriculturists and others, to whom it may be practically serviceable.

Time does not permit me to notice the numerous valuable contributions to Science that have appeared in the entomological magazines. But I have said enough to show that the year 1883 has been one of healthy activity on the part of our Members, whose aggregate activity is the measure of the Society's vitality. We have entered on our second half-century with the steady pace and vigorous tread of men who refuse to retreat. There is work for the Society to do, and we mean to do it.

I congratulate you upon the smooth working of the new machinery for the election of your Council and Officers. No notice of any other name having been sent to the Secretaries before the end of last month, as required by the revised Bye-Laws, the candidates for office have been relieved from suspense, and no ballot is required to-night. My duty is to declare that, by virtue of Chapter 20, Section 5, the gentlemen named in the printed lists that were circulated are the Council and Officers for 1884.

For myself, I accept the position to which you have been pleased to re-elect me with mingled gratitude and regret—with regret that my qualifications for the office fall so far short of my desires, with gratitude for your kindly recognition of my poor endeavours to further the interests of the Society.

I beg to nominate, as my Vice-Presidents, Sir Sidney Saunders, Mr. Pascoe, and Mr. Meldola.

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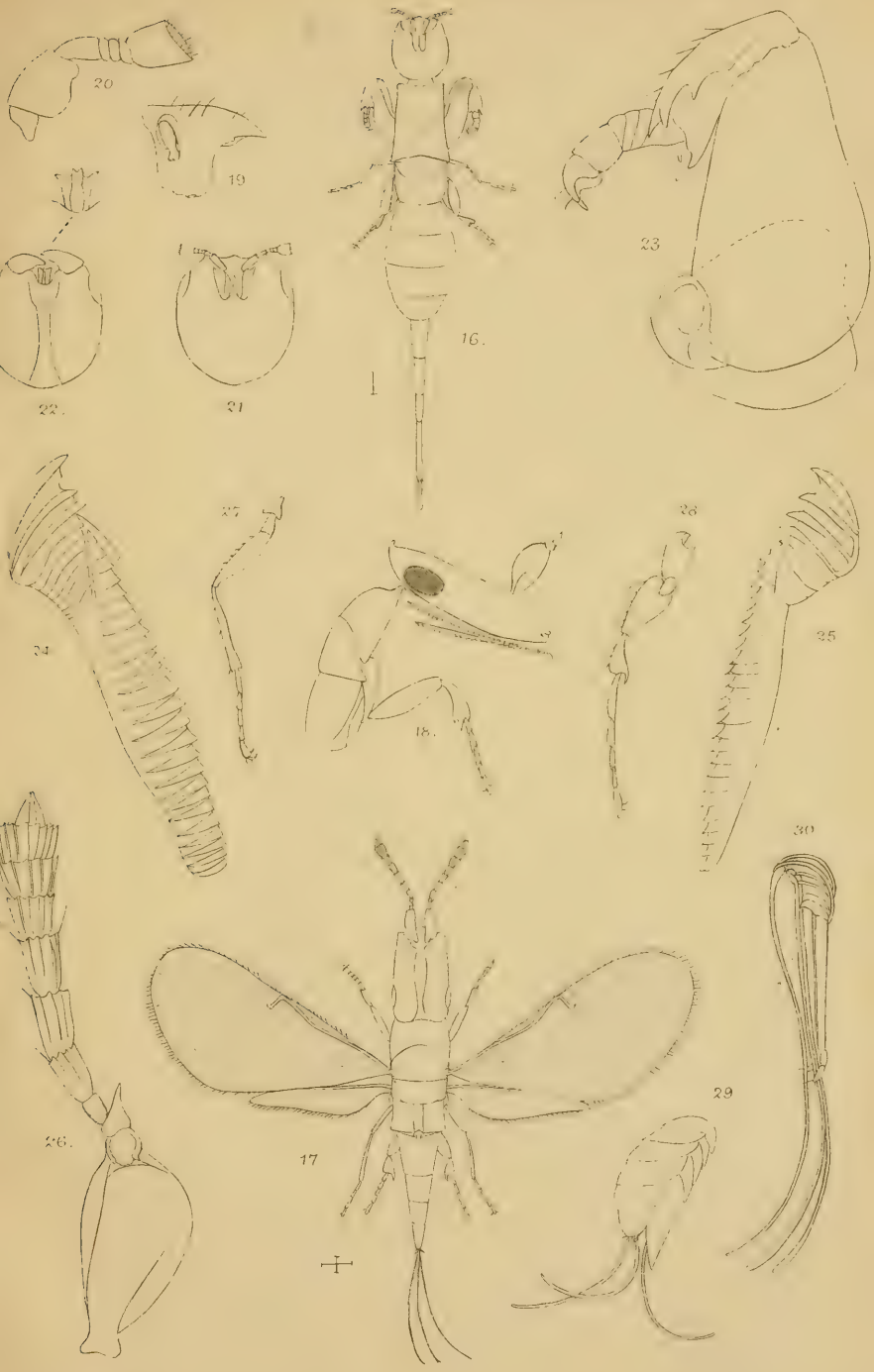

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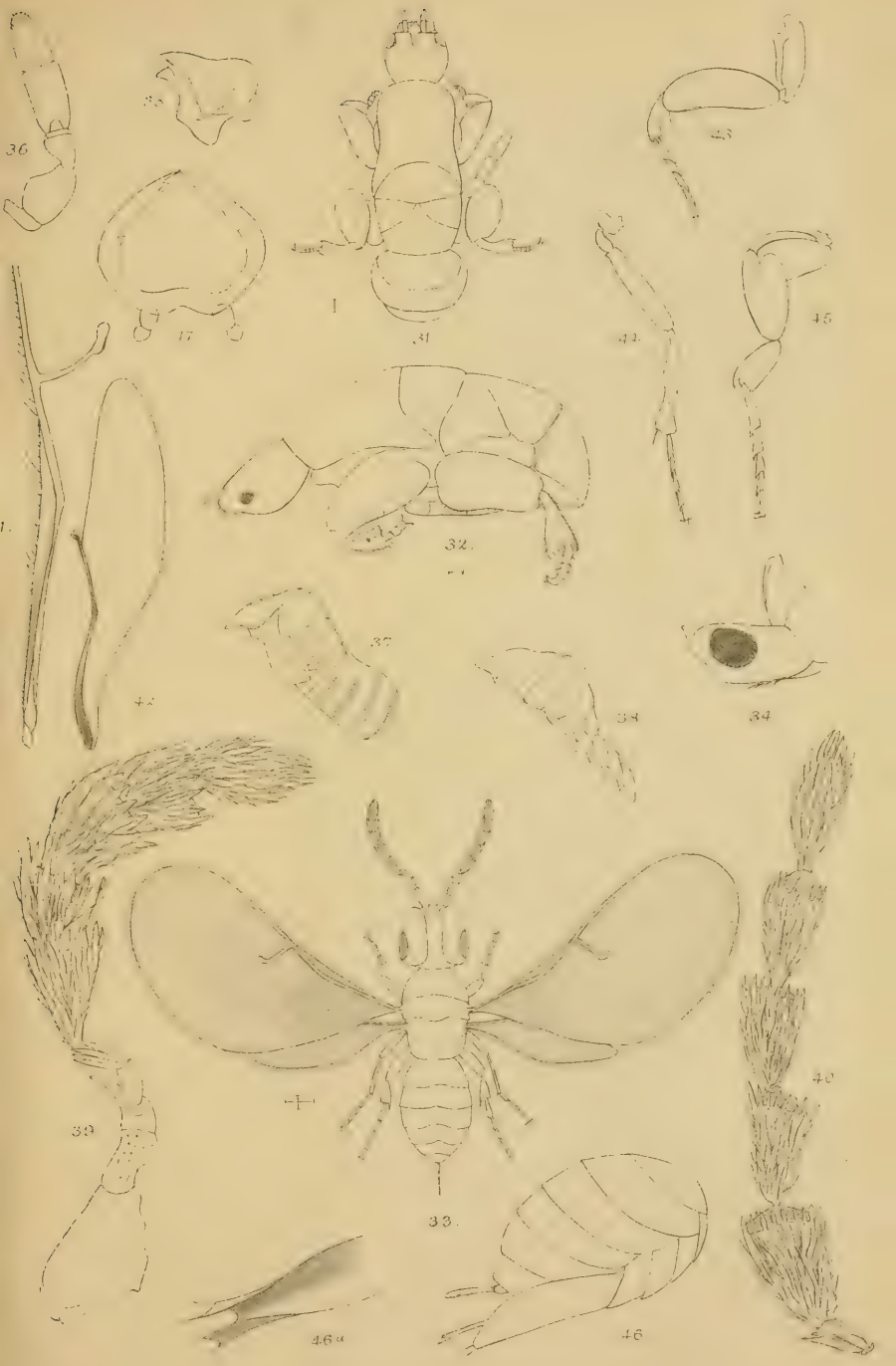

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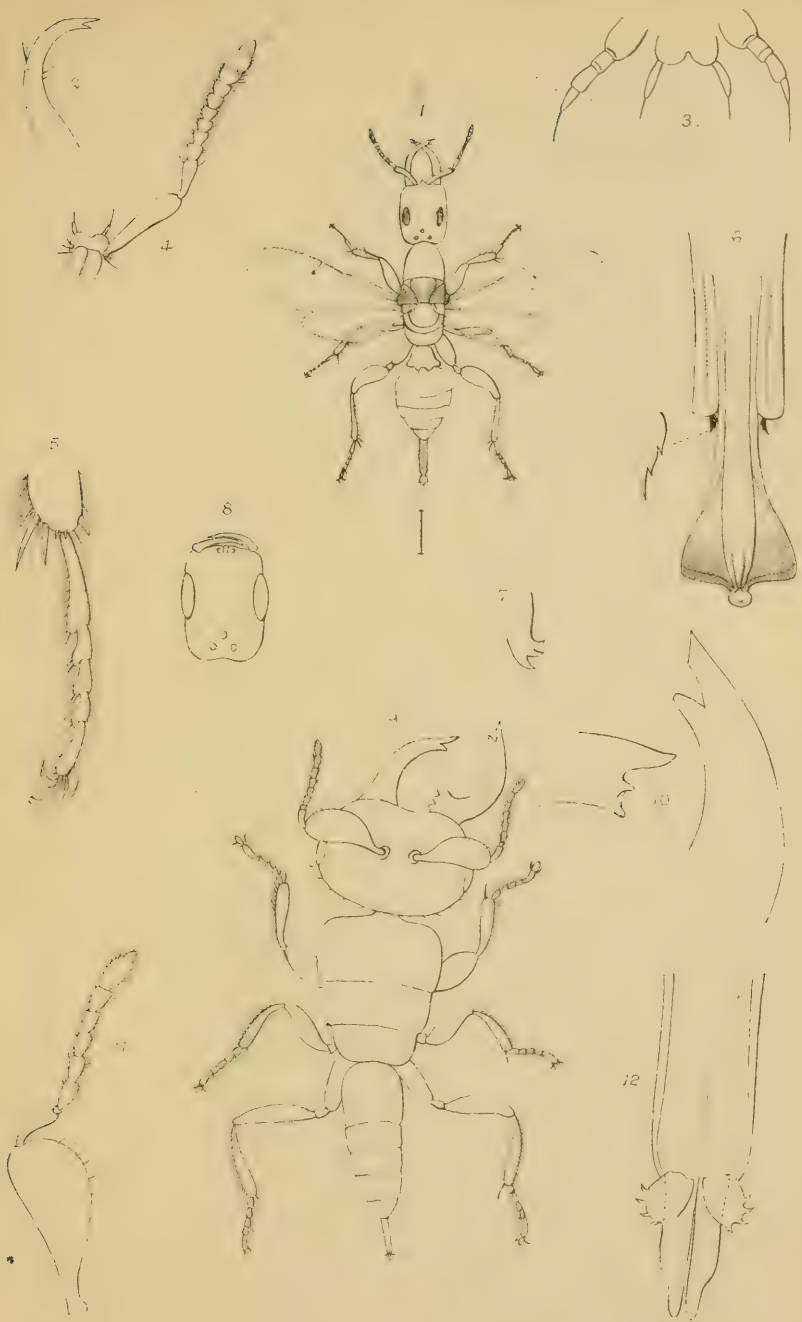

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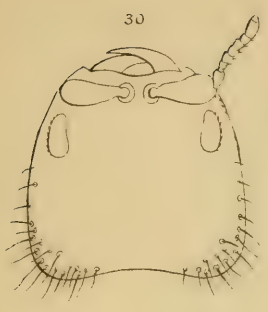
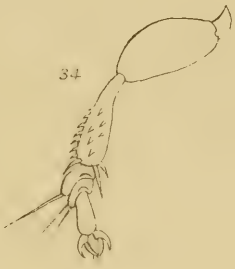
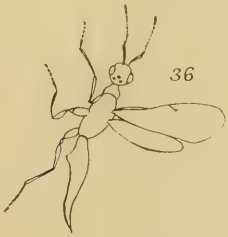
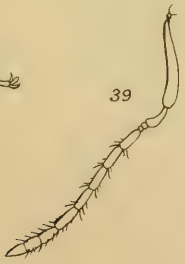
Sycobiella Saundersii, Westw. Sycoscapter insignis, Saunders



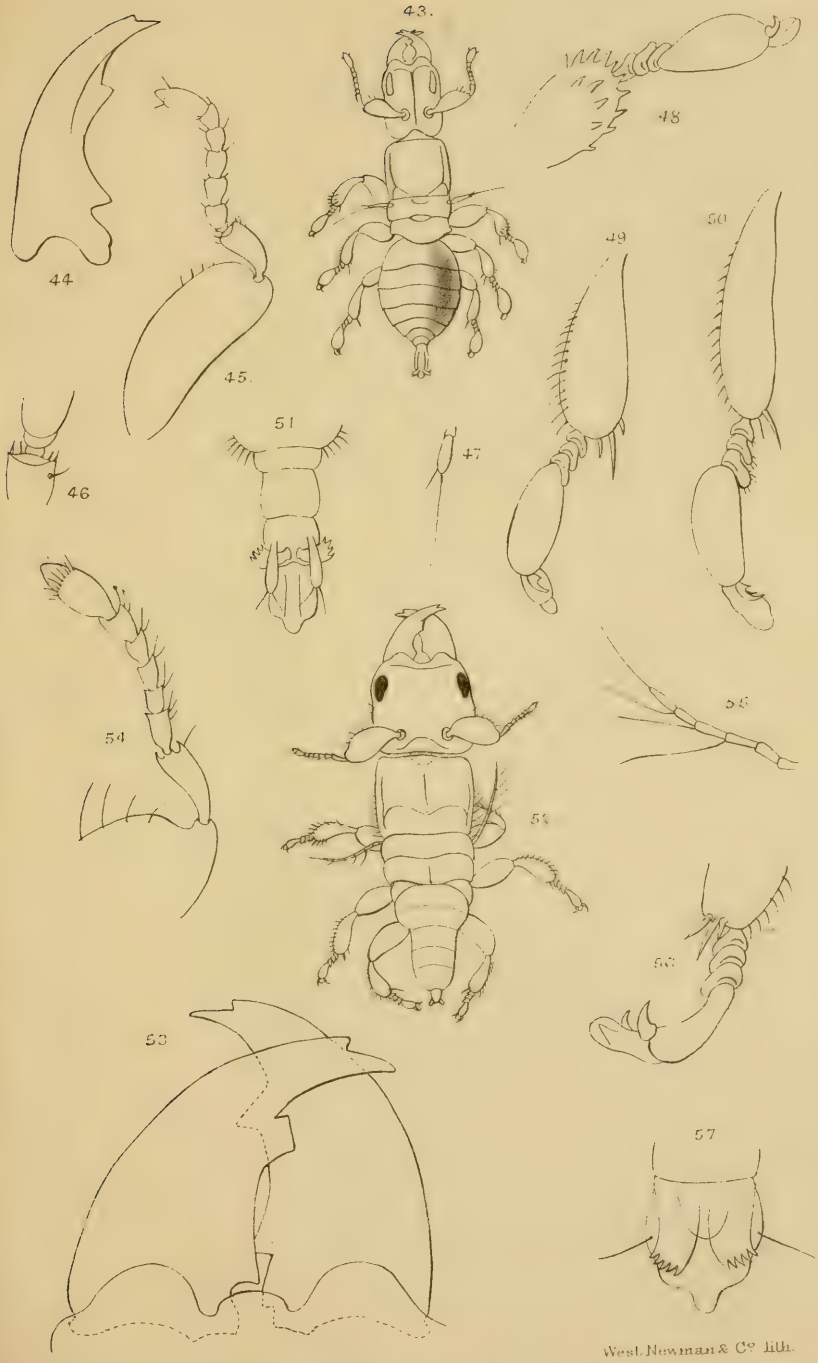






W. del. West Newman & Cº lith.

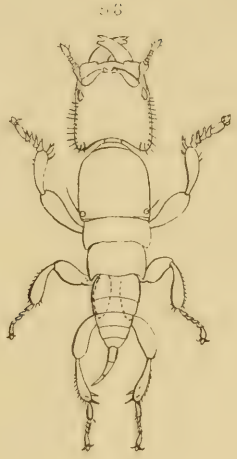
Sycoscaptella affinis, Westw. Idarnella transiens, Walk.

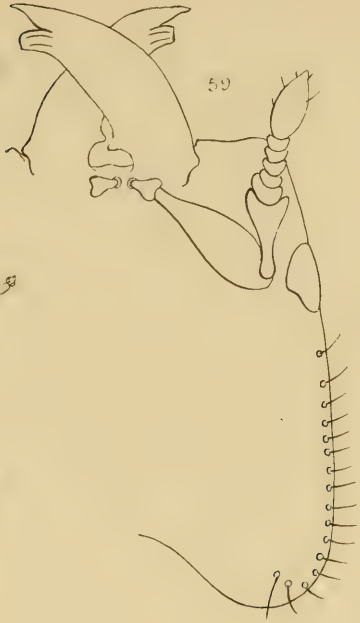


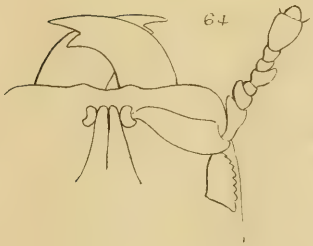
W. del.

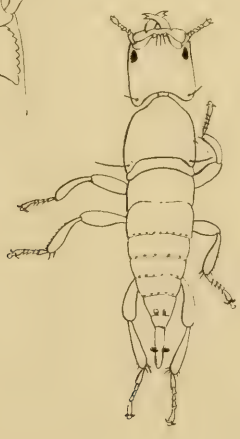
West, Newman & Co. lith.

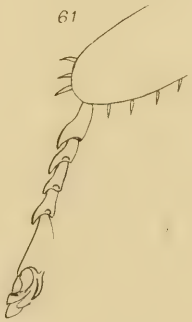
Otitesella digitata Westw. O. religiosa, Westw.

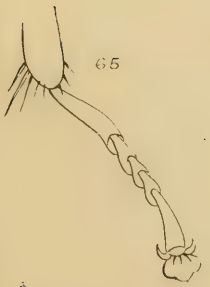






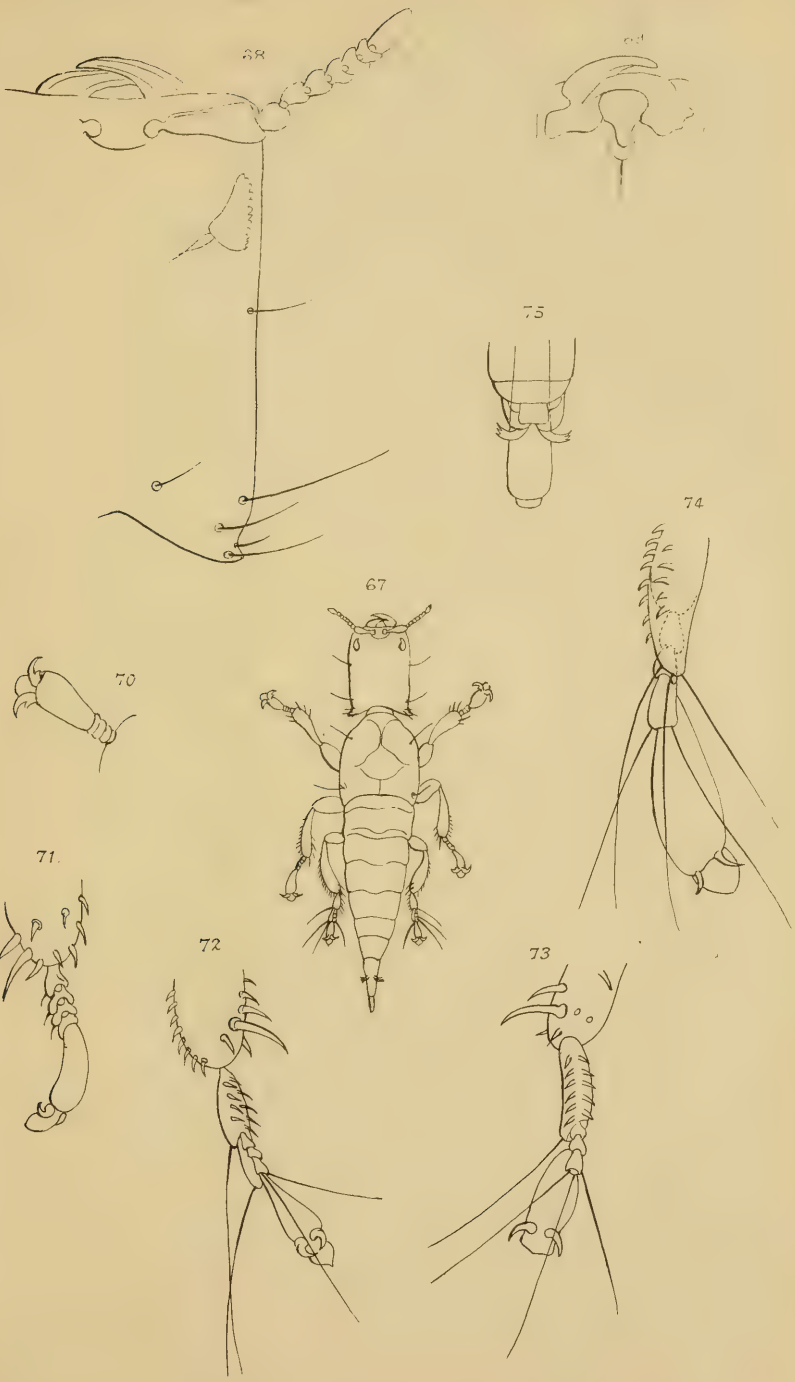






W. del. Vincent Brooks, Day & Son lith.

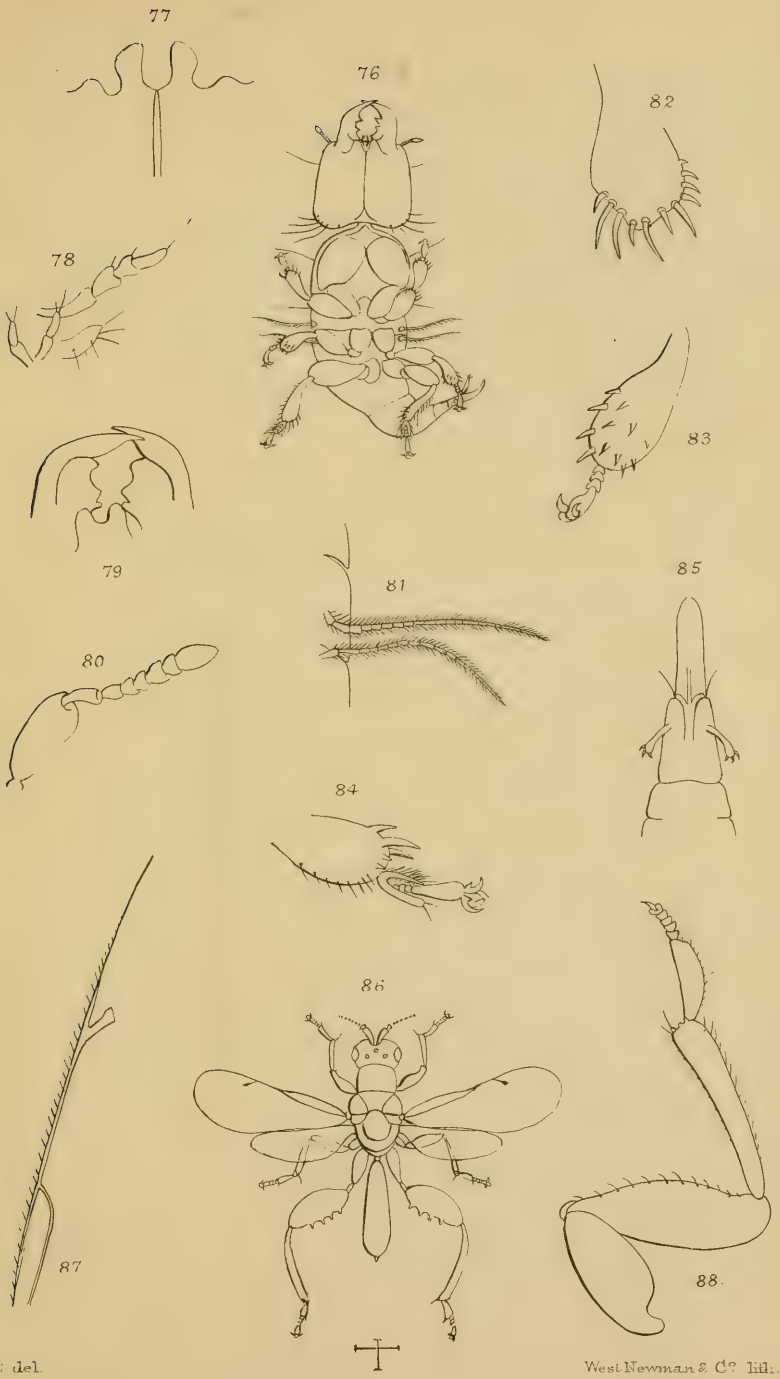
Sycoscapter monilifer, Westw. S. gracilipes, Westw.



W. del.

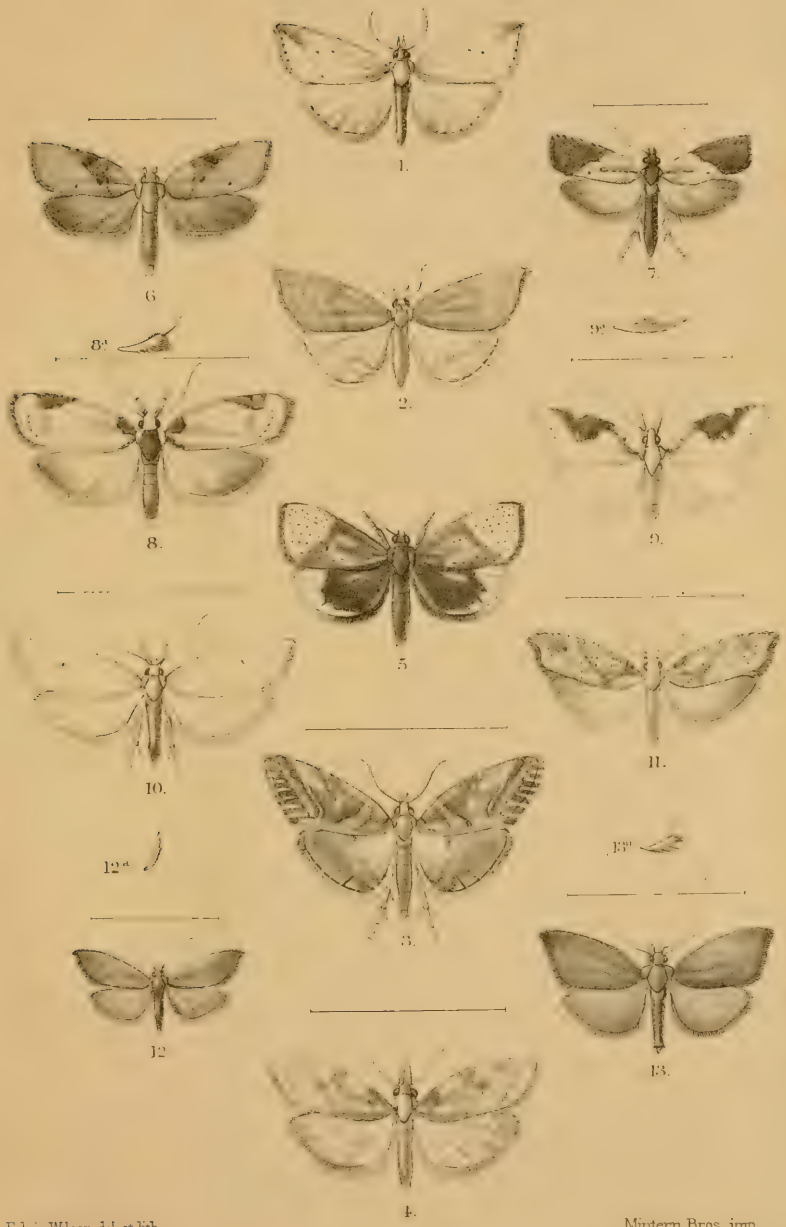
West Newman & Cº lith.

Sycoscaptella anguliceps, Westw.



W. del. West Newman & Cº lith.

Sycoscaptella 4-setosa, Westw. Pachytomus Klugianus, Westw.



Edwin Wilson del et lith. Mintern Bros. imp.

Pyrales & Micros from Chili.

134
144
Y E Z O
42
34
32
30
134
142
144

MAP OF
JAPAN
Shewing
G. LEWIS' ROUTE
1880-1881.
Scale of English Miles.
50
0
50
100
Heights in English Feet
SEA OF JAPAN
PACIFIC OCEAN
YEZO
Sapporo
Hakodate
Awomori
Iwakisan
Hirosaki
Akita
Morioka
Hanamaki
Sakata
Sendai
Tabu Shima
Awa Shima
SADO
Niigata
Fukushima
Koriyama
Shirakawa
ECHIGO
Utsunomiya
Maybashi
Nakasendo
Asama Yama
MAIN ISLAND
HIDA
Ontake
SHINANO
TOKIO
YOKOHAMA
SAGAMI
KADSUSA
Fujisan
Hakone
IDZU
Atami
Oshima
Hachijo
Wakasa Bay
Lake Biwa
KIOTO
OSAKA
Kobe
Nara
YAMATO
Owari Bay
Ki Channel
SHIKOKU
SUWONADA
OKI Is
TSUSHIMA
KIUSHIU
NAGASAKI
GOTO ISLANDS
AMAKUSA
HIGO
Kumamoto
Kagoshima
TENEGA SHIMA
KOREA
CHOSEN
Fusan
From Hongkong to Yokohama 1880
128
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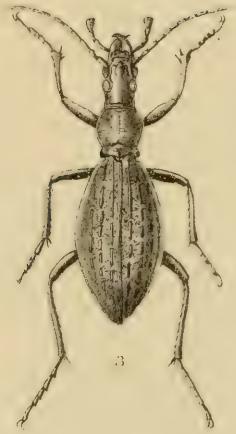
1.

2.



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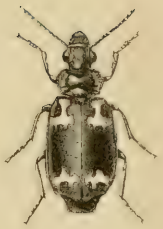
4.



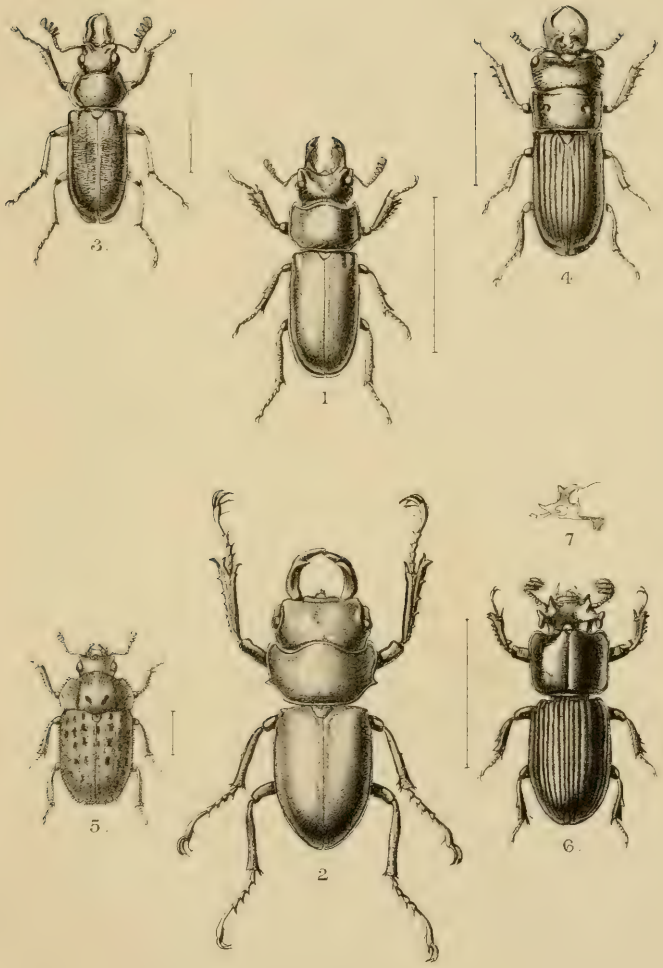
5.

6.

7.

Edwin Wilson del. et lith.

Mintern Bros. imp.



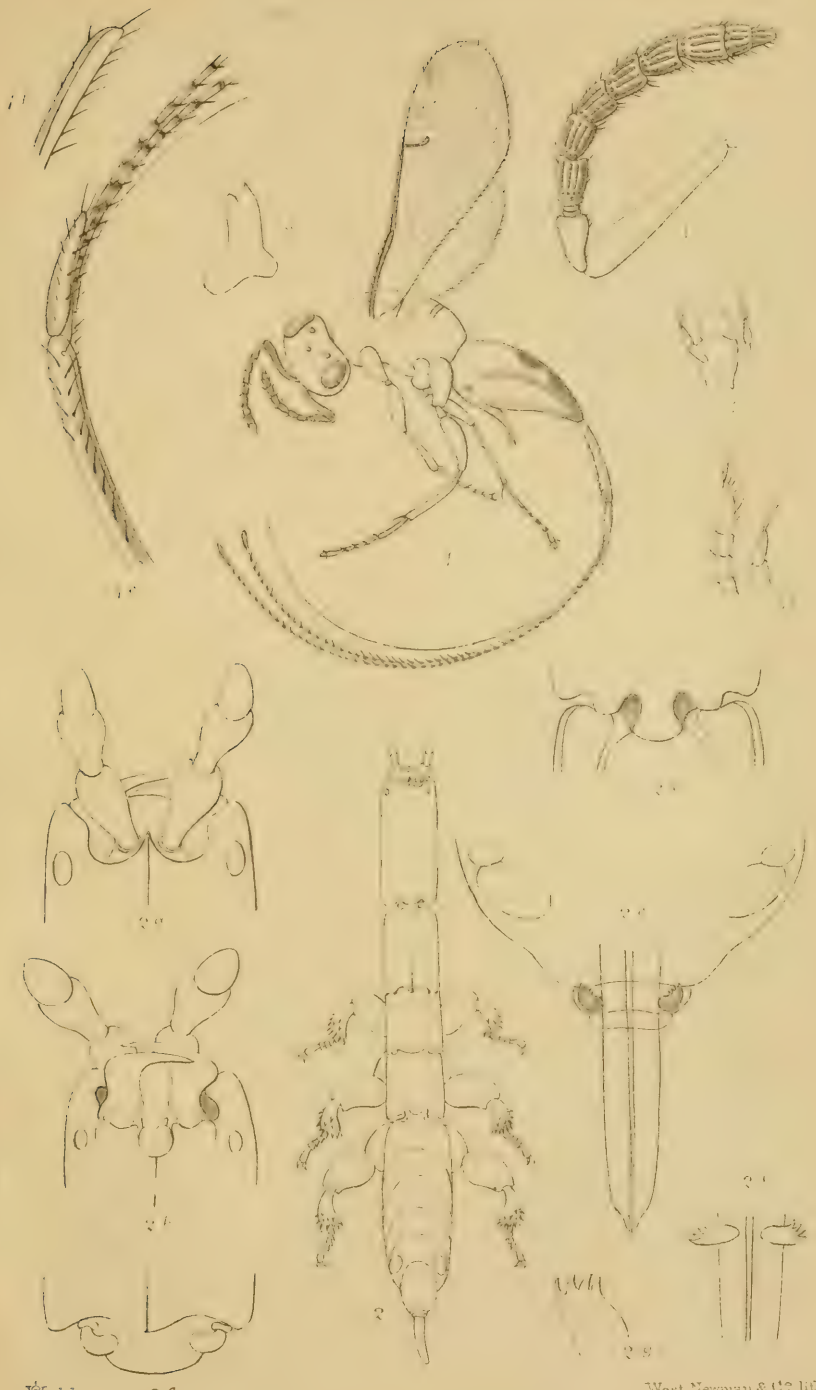
Edwin Wilson, del. et lith.

Mintern Bros. imp.

Japan Lucanidæ.

Mrs Barnard del. West, Newman & Co. chlith.

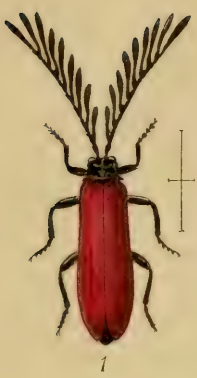
Ogyris. Genoveva, Hew.

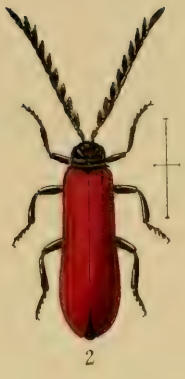


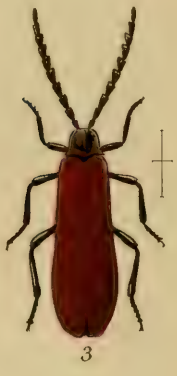
W. del. 2 ♀

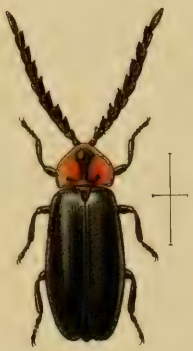
West, Newman & Co. lith.

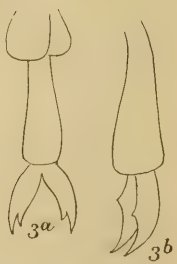
1 Sycoscaptella? 4-setosa, ♀ *Westw.* 2. Apocrypta perplexa. ♂. *Coq.*

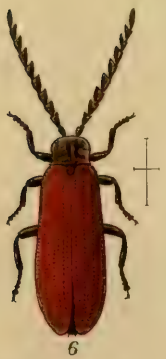


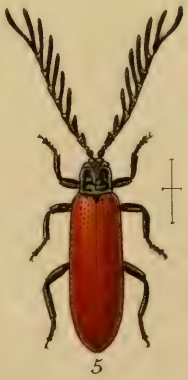


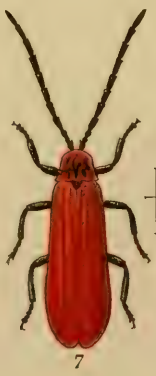


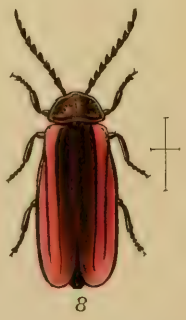








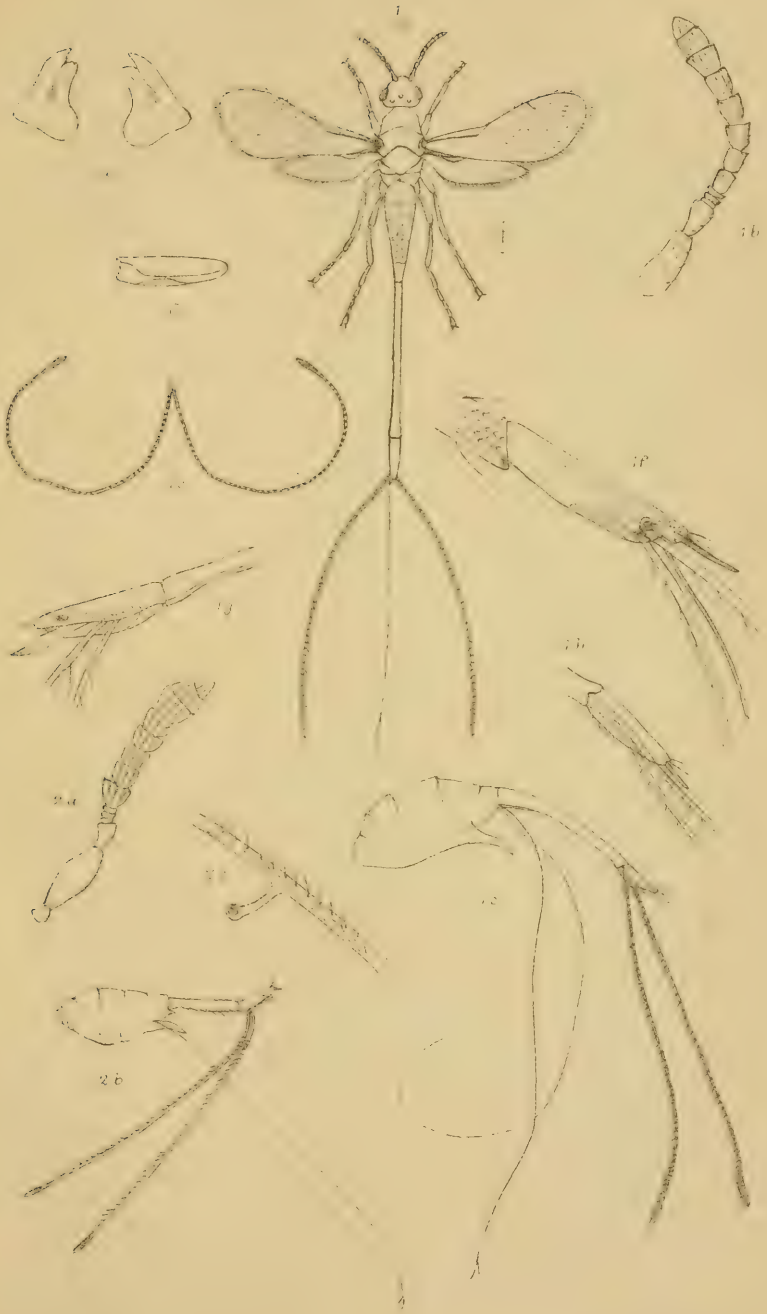




W. Purkiss lith.

Hanhart imp.

JAPAN LYCIDÆ AND LAMPYRIDÆ.



E. Saunders del. West, Newman & Co. lith.

Idarnella Caricæ, *Haselq.* I. aterrima, *S. S. Saund.*

W Purkiss lith

Hanhart

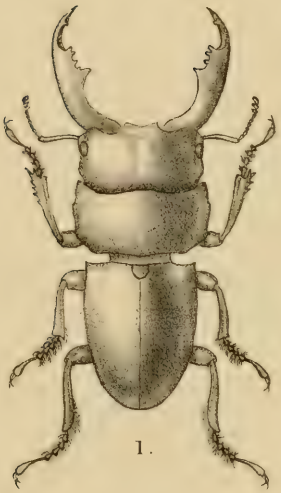
JAPANESE RHYNCHOTA

W. Purkiss lith. Hanhart. imp.

JAPANESE RHYNCHOTA

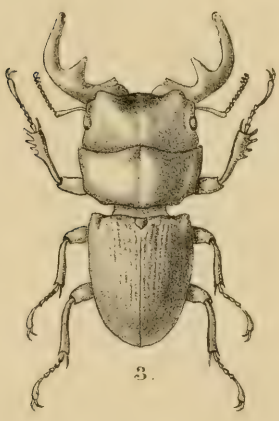
2.

1 b.



1.

1 a.



3.

M. Horman-Fisher, del. et lith. Mintern Bros. imp

1 Eurytrachelus pilosipes, Waterh. 2. E. intermedius, Gestro, var.
3. Ægopsis Waterhousei, Leuthner.

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